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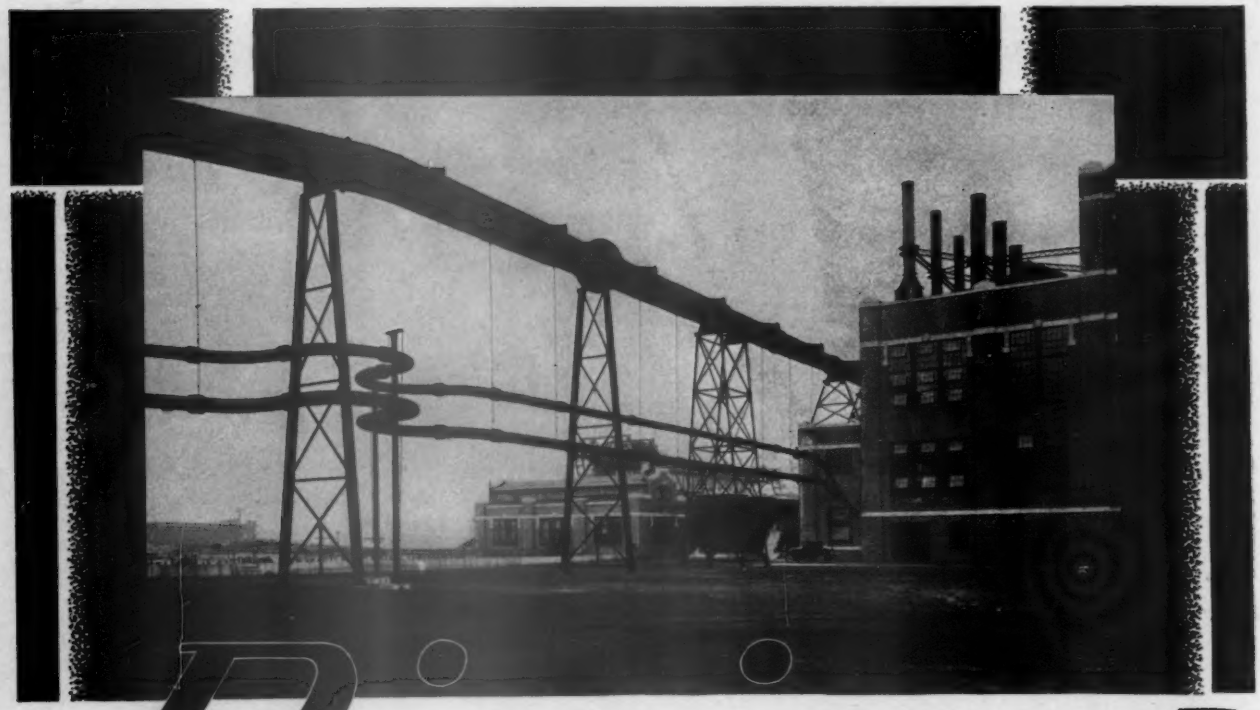

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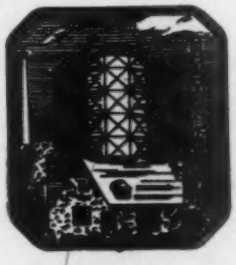

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SEPTEMBER
1936

AMERICAN GAS JOURNAL

VOLUME 145
NO. 3

The Gas Industry in Tomorrow's Sun

By

Clifford E. Paige

President Brooklyn Union Gas Company
Brooklyn, New York

WE WHO are engaged in the manufacture and distribution of gas have an opportunity and an obligation to make our great industry, which already has played such a dominant role in the national economic scheme, a force of ever-increasing public usefulness and influence. In my opinion, there never was a time when any industry was better equipped to go forward than the gas industry of America today.

Nevertheless we face, in spite of the distinct revival of business, many difficult problems, and their solution will require courage, initiative, and determination.

Unquestionably, the present greatest single problem of the gas industry, if the question of taxation be excepted, is competition, which each year seems to grow more pronounced. Competition from coal always has been serious, especially in large-volume sales to industry, but in recent years we have been called upon to meet other competition, particularly that of electricity and oil.

For myself, I state it to be axiomatic that the efficient gas company can meet competition of any character and from any source except the competition of subsidy.

Let us consider for a moment the question of competition from the electric industry, our newest rival, and, on that account, perhaps the most interesting. In my opinion, the competition from this source has not yet been sufficient to cause alarm, not nearly as serious, for example, as the competition we are called upon to meet daily from oil and coal.

This is not to say that there is not a potential menace in this new threat to our prosperity, for the electric companies have, in some cases, unlimited financial resources, and what, in my opinion, is far more to be feared, tremendous industrial backing, it being a known fact that many of the larger companies and the great equipment manufacturers are closely related. This is the only type of competition about which the gas industry needs to concern itself.

Clifford E. Paige

Up to date, the competition from the electric companies, if the experience of our own company, with its 700,000 customers, may be taken as a criterion has been a favorable rather than a harmful factor, for the thought of new competition has stimulated the activities of our people, especially those of the new business department. This is proved by the records. Throughout the years of the so-called depression, notwithstanding reduced general purchasing power, our sales of gas-burning appliances have increased consistently, while recently, in spite of the active sales campaigns conducted by the electric company, the gains have not only been maintained but definitely increased.

Our action in reducing rates last December was in no way influenced by competition from electricity, but was a purely voluntary action on our part, inspired by the desire of testing the theory that lower rates tend to bring offsetting increases in business volume.

Undoubtedly, the gas industry must be prepared to face even stronger competitive conditions than in the past, and to combat this competition, courage, confidence, and an abiding faith in the destiny of gas will be necessary.

What we must always bear in mind is the fact that our product—gas—is unquestionably, incontrovertibly the most efficient conversion of raw heat into heat energy in the world. Electricity speaks only in terms of power, its direct heat application being relatively small. Gas speaks, and eloquently, in terms of mass distribution of heat. There has never been devised—and perhaps may never be—a system for the distribution of heat comparable in any way with the gas mains of a community.

Gas has been the dominant factor in providing cheap fuel. Suppose, for example, the City of New York, or

any other large center, were dependent for its fuel supply on overground deliveries. What would be the congestion, what the cost? Would this greatest of American metropolises be able to function at all? I think not.

A tremendous advantage enjoyed by the gas manufacturer lies in the fact that the consumer of gas requires, as with coal or oil, no storage facilities whatsoever. Moreover, he can take at any given time the definite amount of fuel he may require. When a particular operation is completed, he merely has to turn off the gas. With liquid and solid fuels, a shortage of energy means notifying the company which supplies them. Gas, like the River Avon, flows on forever, and there is always sufficient fuel in the gas holders to meet any emergency.

A decided advantage enjoyed by the consumer of gas, which, in my opinion, we have not sufficiently stressed, is that he pays only after using his fuel, not before as he must when he uses coal or oil. With gas, therefore, he is relieved of an important item of inventory.

The future of the gas industry promises to depend more and more on four chief factors: 1. Research, both technical and administrative. 2. Sound competitive principles, backed by initiative and efficient management. 3. Co-operative effort within the industry itself, particularly in the interchange of ideas and practices. Technical advance—the ability to adapt ourselves to changing conditions. Industry can never remain static. It must go forward, or retrogress.

It should be the single aim of our industry to manufacture gas of the highest quality, and sell it for a price that will permit the payment of adequate wages and allow for a legitimate return on capital investment. Service must ever be our watchword.

Aside from competition, our greatest single problem would appear to be increase of sales, and in this connection it must be remembered always that to develop and hold business a company must possess a well-balanced and efficient business-getting organization.

Gas has already demonstrated that it is the pre-eminent fuel for cooking and refrigeration. For water heating it is the equal, if not the superior, of all other fuels. It should certainly be able to hold its own in the heating and air-conditioning of homes, office buildings, and other structures. In fact, in my opinion gas can be utilized with success and economy in any practice requiring heat application.

We in the gas industry must not permit ourselves to labor under the delusion that there is a limited horizon for the potentialities of our product. For we are in a business whose limits are as boundless as the earth itself, and the realm of our conquest is the whole national economic domain. I have consummate faith in the future of our country, and, knowing how closely it is interwoven into the weft and woof of our industrial fabric, I have the same faith in the destiny of gas.

The trend of business conditions is in our favor. The growing appreciation on the part of the general public of the efficiency and economy of gas for domestic purposes is bringing us constantly increasing sales, and these sales are being further augmented by the technical improvement of gas-burning devices. Nor is this better business outlook confined to the domestic end of our business. In the past few months, there has been a real measure of recovery in the industrial sphere, which, while as yet only moderately effective in most fields, promises to speed up materially as the months go by, bringing to the country as a whole an activity that it has not known for years. It is reasonable to assume, therefore, that the outlook for increased sales of gas, domestic, commercial, and industrial, is promising, to say the least.

In my opinion the creation of enduring business will depend in the future very largely on our ability to distribute a good product at a fair price, render the very highest character of service to our customers and obtain a real standing in the communities we serve.

But there is still another factor, and that, perhaps the most important of all, the adequacy, efficiency and loyalty of our organizations.

If there is any one thing of which our own organization is proud it is the co-operative spirit that permeates every single department, and the feeling that ours is a public utility in the true sense of the term, meeting its public on the common ground of understanding and goodwill. With us the days of remoteness from our public have gone forever. We have broken down the barriers, and today our public is able to contact anyone in the organization, from the highest official down.

We are constantly trying out new ideas for the expansion of sales. One of our most successful innovations has been entering into a liaison, if I may so term it, with the dealers and plumbers of our territory. We all know that frequently dealers are instinctively hostile to public utilities because they feel that in selling and stalling gas-burning devices the gas companies are poaching upon their own preserve, and, from their point of view, perhaps there may be some justificaion for the hostility.

We conceived the idea that if some arrangement could be entered into between the company and its dealers and plumbers whereby all could cooperate to their mutual advantage, we should be able to create some very valuable sales alliances. Obviously, such an arrangement could be consummated only in finding a common ground of interest, with the gas company, dealers, and plumbers all moving forward, as pineers, with the single aim of increased sales.

To state that this plan has been extraordinarily successful is to be conservative. The relationship has proved an extremely useful one, and is, we believe, a permanent feature of our selling structure. Now, year by year, plumber, dealer, and gas company, working in the closest possible relationship and harmony, are selling a constantly increasing number of appliances, and, of course, materially augmenting the consumption of gas. Last year approximately 25,000 ranges, water heaters, and other gas appliances were sold by our company, which figures, this year, we expect will be materially increased.

Another factor in our sales structure, and one of growing importance, is our Home Service Division, whose chief function is the promotion of gas consumption through public demonstrations and distribution of literature. Last year more than 25,000 Brooklyn women attended these demonstrations, and an approximate total of 350,000 recipes, leaflets, and other promotional literature were distributed.

Recently this division has commenced to render another service to the community that is meeting with wide approval. This is the inauguration of special monthly demonstrations for the benefit of the preceding month's purchasers in the use and care of gas appliances. Last year, more than 1,500 women attended these demonstrations.

A dominant factor in the success of our sales has been our Employees' Sales Promotion Plan, which, established in 1933, is proving even more effective than its progenitors had hoped. This is a strictly co-operative

(Continued on page 12)

Domestic Gas Utilization

Range Division

Top Burners—Part IV

By

Charles W. Merriam, Jr.

Manager, Lynchburg Gas Company, Lynchburg, Virginia

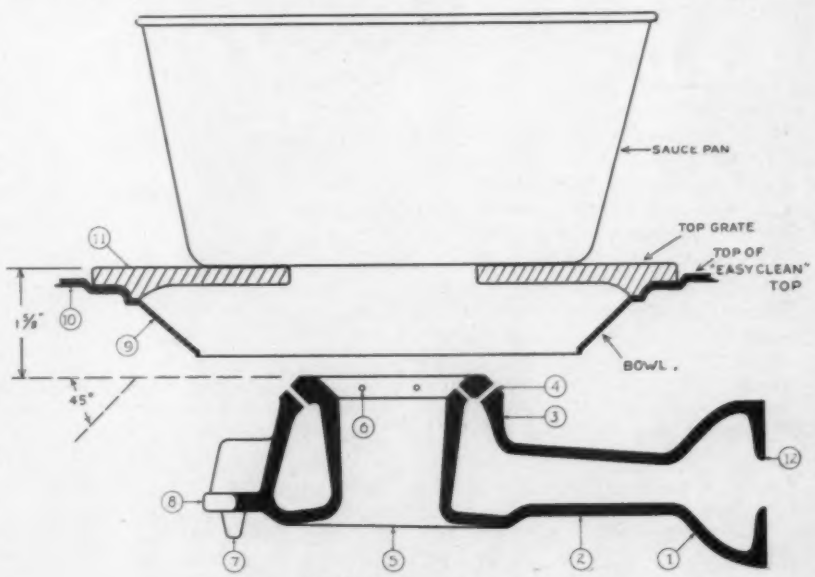
WITH a deadly earnestness that would do credit to the *Congressional Record*, we examined in the previous article many of the basic principles bearing upon domestic range burner design, operation and adjustment. Failure to chew up to fine tidbits that presentation of elementals might contribute to a mild case of mental indigestion upon attacking this, the second part, treating with "Top Burners." Better get the foundations laid first before erecting the superstructure.

The Round Burner

In the preceding article the star type of burner was employed for purposes of illustration largely because the majority of ranges now connected to gas mains are equipped therewith. The march of progress ushered in the round burner during the early 1930's—and the word progress is used advisedly—which burner is subject to identically the same natural laws as the star type. In fact, insofar as the burner itself is concerned, the essential physical difference is in the shape and size of the head and the attendant changes in port arrangement. This trend, however, toward the round burner is no mere concession to style in the sense that something new is ordered by the demands of fashion. The round burner possesses genuinely worthwhile customer benefits of a magnitude that justify the purchase of a modern gas range. If any single feature distinguishes the old from the new, the round burner ought to be unanimously elected. From what do these advantages spring?

Resorting first to a picture drawing, the accompanying sketch shows the detail cross-section of a round burner. Whereas the star had eight arms, in which were drilled vertical ports causing the flame to project straight upward, the type here shown, as the name denotes, is round in shape but with the ports drilled on a 45° angle, causing the flame to project outward as far as its velocity will permit for any given gas. In reality, the round type has two concentric circles of ports, approximately 85% of the gas emitted being from the outer circle and the balance, or 15%, from the inner circle ports. Observe, also, that a fairly large size hole extends all the way through the burner casting, thus allowing secondary air to progress upward to facilitate combustion of the inner circle of flame and to aid the outer flame.

The difference between the head diameter of the star and the round types is substantial, the extreme ports of the star being about 4.1" apart compared to the outer port circle diameter of the round burner being approximately 2.5" (both burning 9,000 Btu. per hr. input). The diameter of the star shape, therefore, is 64% greater than that of the round type. This lessened diameter of the round burner presents less opportunities for boil-



Circular Top Burner

The gas burner shown in the drawing is round in the shape of the head (3) commonly styled a circular burner. The mixing head (1) rests on an orifice spud (not shown) that protrudes through the opening at (12). The mixture of gas and primary air progresses through the mixing tube (2) into the hollow burner head (3). Gas issuing from the outer ring of ports (4) and the inner ring (6), both at an angle of 45° with the vertical, is ignited into flame where combustion is completed upon contact with secondary air raising through the center of the burner at (5) and also up between the burner head (3) and the bottom rim of the circular bowl (9). One end of the burner rests upon the orifice spud at (12) and the other end at the surface (8) and the alignment peg (7).

The products of combustion rise upward inside the bowl and through the circular "finger" grate (11), i. e., between the prongs. The grate (11) fits into a circular groove in the top plate (10) thus forming a so-called semi-closed top discussed later on. The products of combustion escape from between the fingers and the underside of the vessel. The ease with which combustion products escape is governed, among other things, by the distance from the top plate to the top of the grates upon which the vessel rests, usually about ¼". The amount of secondary air is controlled in several ways, among which is the diameter of the opening in the burner head at (5) and also the distance between the ports (4) and the bowl (9). The longer the flame issuing from ports (4) and (6), the less the percentage of secondary air mingled with the products.

overs to clog the ports, a fact that some astute demonstrators illustrate on the show floor by employing an ordinary kitchen measuring cup for comparisons.

By virtue of the bulk of the gas being discharged at an angle of 45° away from the center, the diameter of the outer circle of ports must be small enough so that flame will not overshoot, or extend beyond, the bottom of the normal cooking vessel. Conversely, too small a head would cause excessive concentration of heat near the center, thus leading to uneven temperature distribution within the utensil. Note that the inner flame is at an angle of 45° toward the center or at right angles to the flame direction of the outer circle. No particular laws cover this port arrangement other than the *cut and try* method.[1] That the heat distribution from a round type of burner is superior to that from a star is readily observed by placing a water filled glass dish over the two resultant flames. Some floor demonstrators with a Barnum and Bailey flare for showmanship keep a glass pie plate available to drive home to the customer the improved heat distribution of the round burner—sort of "selling 'em through the eye."

The normal flame from the round burner, even though projecting outward at a 45° angle from the burner head (or even horizontally), does not assume a circle of over 3.2" diameter before the flame is moving virtually straight upward. This lifting action of the gas flame is brought about by two factors, namely, the inrush of secondary air and secondly, the lightness of the combustion products and the flame under relatively high temperatures. At first blush this phenomenon might appear slightly theoretical, but, ponder the thought that this allows the heated gases to scour the under side of the utensil, thus permitting accommodation to any shape or size of vessel from a small sauce pan to a 12-quart stock kettle. What marked contrast this is to the electric top element, upon which a vessel too small permits measurable heat losses into the atmosphere, whereas, one too large introduces uneven heat distribution. The usual electric range has two size elements, approximately 8-9" and 5-6", to which diameters all cooking utensils must conform in order to attain that much-needed thermal efficiency. To a gas range, any pot handy is agreeable. This happy circumstance does not impose upon gas customers the necessity for purchasing a special set of cooking utensils, as is the case with *electric cuckoo-ery.*

Note in the drawing of a circular burner that the distance from the ports to the bottom of the pan is 1⅝", which height is widely accepted as standard for either this or the star type of burner. This height is sufficient to allow wide fluctuations in gas pressures without objectionable carbon monoxide, CO, releases. One of the rigorous tests in the process of securing a Blue Star Seal of Approval from the A. G. A. Lab. (see Am. Std. "Approval Requirements for Gas Ranges.") specifies a maximum limit of 0.01% carbon monoxide concentration in 1,000 cu. ft. of enclosed space, having 1 air change for each 15,000 Btu's. burned. This standard must be met even when gas pressures vary from 0.5 to 1.25 of normal (3.5" on manufactured and 7.0" on natural gas being selected as standard for the original adjustment). In field practice most burners will not give off excessive CO even when the pressure is as much as twice normal. This latter is primarily due to the distance between utensil and burner having an extra factor of safety to guard against such abnormal pressure conditions.[2]

Care of Round Burner

Under reasonably favorable conditions gas top burners retain original efficiencies over a long period of years. Among the factors contributing to continuity of thermal effectiveness particularly in the round type of burner, is the ease with which cleaning can be accomplished. A simple wiping, or brushing off, will normally suffice to remove spill-overs from the burner head. Occasionally, circumstances require the use of some sharp instrument, such as an ice pick, match, or hairpin, to poke down through the ports. In extreme cases, a thorough job can be completed by simply removing the burner from its rack and either washing in the sink or boiling rigorously (do not use soda in solution on an aluminum head). Any of these operations can be performed by a grammar school girl in pigtails. Contrast this with the highly vaunted cleanliness of the electric top elements. Did you ever attempt to clean food deposits from in and around spiral resistance coils sunk in the grooves of a refractory disc?—in the words of an ancient quip, the process is analogous to picking fleas off a Pekinese dog with boxing gloves. Or did you ever endeavor to negotiate the removal of a "Calorod" unit to clean up underneath after a boil-over?—more than the services of an ordinary kitchen mechanic are needed. The gas burner is both the cleanest method of top cooking as well as that having the greatest uniformity of efficiency.[3]

---

[1] *Other burners are marketed with the ports of the outer circle being in a horizontal position instead of on a 45° angle with the vertical. The claim is advanced that this arrangement tends to retard the clogging of the ports from "spill-overs" by exposing no gasway upon which material can fall.*

The burner here shown is a homogeneous casting, although many burners are made with the center and top position in a separate metal alloy (basically aluminum) that screws from above into the bottom of the burner thus forming the inner wall of the burner head gas chamber. Partisan interests claim that this removable casting makes for easier cleaning by the customer. Certain it is that this type of burner head in the hands of a skillful salesman offers possibilities for a forceful demonstration with such pat plausibilities as "hard to get dirty, easy to clean." Unfortunately, continued careless use in the home without regular removals at short intervals causes many of these heads to stick firmly enough to require a special tool, or the attention of a service man to effect removal. In addition, the human equation figures into the return by the housewife of the screw-in head to the original position. Such removable heads must be correctly seated because failure so to do leaves the burner close to the utensil in a high heat zone, thereby causing blistering, or warping. Further than this, a tight fit between screw-in head and the burner body is necessary in order to secure the proper port opening. In fairness, it must be said of the removable head type of burner that even though stuck in place the cleaning operation is no more difficult than with the solid cast burner.

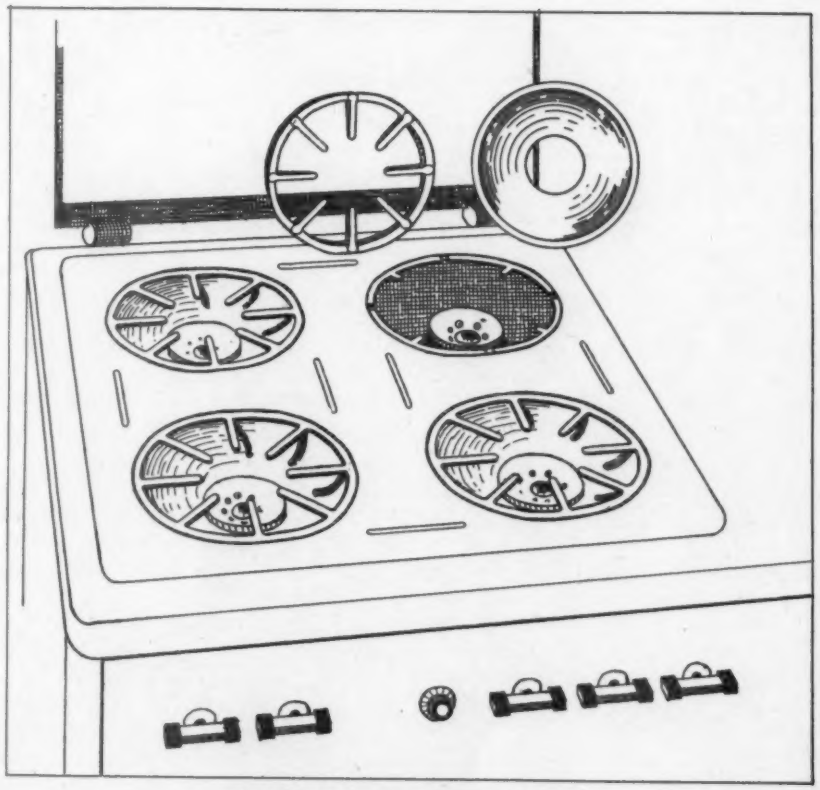
[2] *Several extremely interesting modifications on this general phase of burner design are in evidence. One successful round burner is now marketed whose ports are but ¾" from the under side of the vessel. The CO element of the problem is met by having a greater number of ports of smaller area bored to allow a somewhat shorter flame projecting in a horizontal direction.*

Still another treatment of the problem has been attempted by the so-called raised burner-fixed orifice-pressure regulator method, which has been pronounced successful where tried in the field. This as yet obscure approach involves continuity of pressure from an appliance regulator, which by discharging through a fixed orifice, provides an unvarying Btu. input. With this factor constant at approximately 6,000 Btu. per hr., advantage can be taken of raising the burner (of the type similar to that here shown) up to within ⅞" of the vessel. Test efficiencies have been secured up to 59%. Unfortunately, this unique arrangement cannot receive the A. G. A. Blue Star because of the Btu. input being less than the 9,000 specified in the present standard requirements, despite compliance in every other respect. For some interesting side lights on the pressure problem see "Pressure Regulation For Appliances," presented by A. D. Mac Lean at the New England Gas Assoc. meeting of Jan. 1936.

Range Tops

Few, other than *those in the know* appreciate the multitude of benefits accruing from new mode treatment of gas range tops as assisting in burner operation. Most housewives, on contemplating the so-called semi-closed top in contrast to the old-fashion open grates, react along the lines, "Oh, isn't it lovely not to have to see those filthy, rusty, old burner tubes." Or, perhaps, the ejaculation is, "How much easier this new range is to keep clean around and between the burners!" All this feminine response to beauty and sanitation attaches value in generous portions to the *Modern Gas Range*, but the economic worth is seldom observed or translated in terms of saving in gas bill.

The accompanying drawing depicts a "Semi-Closed Top," in which for purposes of illustration, two of the removable parts from around the burner have been placed out in view. The circular "finger" grate (also shown in the previous cross-section drawing of the circular burner) fits into the circular groove in the top plate, thus forming a rest for the utensil slightly elevated above the level of the upper surface of the top plate. The bowl, or cup, fits concentrically down around the burner head with the latter visible in the center circle. In this particular instance, the bowl is removable, but in the cross-section drawing of the circular burner the bowl is cast integral with the top plate. The economic purpose of the bowl is threefold, namely, first to limit the amount of secondary air admitted to the zone of the outer circle of flame; second, to direct the flow of such air to the flame where needed to support combustion; and third to confine and direct the liberated heat against the vessel instead of allowing the heat to wander around aimlessly underneath the top plate. Thus the bowl of the semi-closed top contributes to improved utilization efficiency. Observe also on the drawing that between the burners long, narrow ridges have been placed in the top plate, which ridges project up to the level of the grate tops. The purpose of these ridges is to facilitate moving vessels from one burner to another and to prevent irregularly placed utensils from tipping, or tilting.[4]



Semi-closed Top for Domestic Gas Range.

Considering the sales appeal incorporated in these semi-closed cooking tops, it is surprising how little emphasis on this feature is in evidence during normal floor demonstrations. *Mere man* is too frequently wedded to the cold, logical facts to permit imagination to walk in step with that of the feminine mind. Economic considerations are always vital, but woman's aesthetic appreciation can be traded upon. For a housewife to clean up a cooking surface of this character with but a whisk of a damp cloth is an admired luxury. Escape from the heathenish sight of age bespattered burner tubes is a blessing of modern genius. Hit 'em hard with this important aspect of the Modern Gas Range.

A second method of gaining substantially those results achieved with the semi-closed top is currently practiced. By elevating the drip pan above the mixing tubes, an arrangement made possible by punching holes in a stamped metal sheet to permit the burner heads to protrude through, secondary air is limited with respect to requirements. The accompanying drawing shows this so-called "Burner Tray." Open top grates (not shown in drawing) supported at the outer edges, spread across the burners with the cuscustomary intervening space. Slightly elevated lips around the burners and also division into quarters by raised ridges ingeniously assist cleaning operations. These circular lips also have the happy faculty of virtually preventing boil-overs from continuing on downward around the burners.[5]

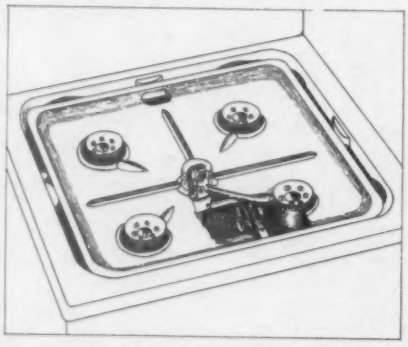
Utensil Color

In conjecturing upon the virtues and limitations of gas top cooking, mention can appropriately be made of the processes of heat transfer involved in attaining the desired results within the utensil. Having pre-

[3] *The electric resistance coil upon being raised to a dull red heat has a tendency to oxidize (oxygen in the air combining with the metal to produce an oxide film in many respects similar to rust), thus forming an insulating surface of a foreign material that retards the flow of radiant energy. Several recent domestic designs have sought to eliminate this inherent difficulty by embedding the resistance coil within a metal plate upon which the utensil rests directly. Dirt, scale or deposits of any nature will decrease the efficiency of heat transfer. R. M. Couner in the March 1935 issue of A. G. A. Monthly, page 104, reports that after 1000 hrs. use a tubular (presumably "Calorod") unit had an efficiency loss of 18% and two open type units 5.4% and 6.4% loss respectively. In ordinary household usage it is fair to assert that efficiency losses on electric top elements would be at least as great as those shown above, probably greater. Several large electric companies are recommending replacement of top elements after 1000 hours of use, rather ironic in as much as from 1200 to 1500 hrs. of use constitutes the normal operating life of the open units.*

[4] *Enamelled semi-closed tops are now on the market made up in steel as well as in cast iron. Steel offers lightness in weight which is desirable when the plate is removed for cleaning or burner adjustment. Cast iron on the other hand is heavier, being suggestive of solidarity—that sort of "Packard-door" sound and feeling.*

viously discussed the three basic methods of heat transfer, i.e., conduction, convection, and radiation, the assumption is that the reader has a working conception of three ways in which heat from one point may arrive at some other point. Heat liberated from a gas burner is chiefly conveyed to the bottom of the utensil by the sensible heat in the products of combustion. A very slight amount of heat reaches the utensil by radiation from the yellow flickers and color in the flame. Even a perceptible quantity of heat is conducted to the utensil through the physical contact with the metal grate fingers. However, by far the bulk of the heat reaches the vessel by that method of heat transfer classified as convection. The significance of this apparent triviality is that because convected heat is absorbed with approximately the same readiness irrespective of the color of the object whose temperature is being raised, no appreciable economic advantage is gained by a gas user in employing special red exterior, or black bottom, colored pots and pans as now appear occasionally on retailing counters. That such specially designed cooking equipment is the stock and trade of the electric proponents can be appreciated by considering that an entirely different method of heat transfer is employed. The electric resistance coil whose temperature has been elevated to the point of glowing irradiance throws off energy primarily by radiation which form of heat transfer is markedly affected by the surface color and lustre of the absorbing object. Electric cooking over a top element is improved as much as 15% in thermal efficiency by the use of a black or red bottom pan.[6] The implication is that with gas any garden variety of utensil is satisfactory, whereas with *electric cuckoo-ery* rather expensive outlays incorporating both special sizes and colors are required to conserve those precious kilowatt hours.



Burner Tray and Top Lighter.

The solid, or so-called smooth top, emulating the coal stove surface has spasmodically found varying degrees of public acceptance. Mechanically, this arrangement involves burners firing up against a ground and polished cast plate having embedded but removable round discs, or "eyes." Products of combustion are vented from the rear. The area immediately over the burner becomes exceedingly hot with the intensity of temperature decreasing according to the distance from the "eye." One element of the theory of this specialty type is that gradations of heat are afforded from the slow simmer to that of violent boiling in a manner presumably fancied by masters of French cuisine. Obvious advantages are inherent in the solid top type, including an unencumbered flat top, excellent possibilities for keeping cooked or partially completed foods warm, and concealment of flame, which for some inexplicable reason is repugnant to the sight of some people. The obstacle surmounted with the greatest difficulty by the non-professional cook is judging the heat contained in a dull dark iron top, whereas with the open flame, the burner adjustment is visual. The consensus of opinion is that in general the field is somewhat limited to applications in kitchens habitually concerned with meals of many courses, or operations in which the range is loaded to capacity, establishments equipped with vent hoods, or to either customers not caring a fig about gas consumption or those who will frugally employ the range strictly in accordance with instructions.

[5] *Arguments concerning the relative merits of the semi-closed top versus the high burner tray are heated by partisanship. The former dispenses with the rather graceless, large grates in favor of the individual circular grates. In addition, the bowl directs heat to the area of usefulness. The burner tray boys talk of better disposition of the spill-over aspect, but in some quarters, this is offset by the logical expedient of molding a lip around the bottom of the conical bowl. Adverse claims (difficult to substantiate) are made that on the semi-closed top the frequent use of large pans tends to foster deterioration of the surface. The majority in the Gas Industry agree that the semi-closed top has a shade more finesse.*

The raised burner tray drawing depicts the ignition method by which the flash tubes convey gas from the burner head toward the central pilot light and back again to light the gas emerging from the head. In this instance the flash tubes are stop welded to the underside of the tray. This type of instruction by making the flash tubes rigid advances the ease of cleaning burners as well as the cause of safety.

[6] *Numerous references are available on the subject, but perhaps the most practical is on Pages 24-27 of Bulletin No. 6 of the American Gas Association, which publication should be a part of every retail salesman's kit.*

It is interesting to observe that with a coal stove heat is transferred through the top plate almost solely by convection whereas with an oil stove the process approximates that of gas with but slightly more radiation.

(Continued from page 8)

movement within the organization itself, but its results have been remarkable, having resulted, last year, in the sale of 1,889 appliances to prospects suggested by our employees, and 518 applicances to the employees themselves.

In all communities, of course, different problems arise, and have to be overcome, but fundamentally the conditions affecting a single industry are common to all those engaged in it. To be successful in any sphere, one must work hard, and exercise skill. We must all work together for the common good, and strive to erect an industry that will stand on an unassailable foundation of service and integrity. Words are idle unless translated into action.

I am a firm believer in the gas industry as a vital and permanent force in the economic life of our country, and I believe that if all of us who are engaged in it will cooperate to the utmost in promoting its welfare and the common interest, establish and maintain a high code of business ethics, and render the public the character of service to which it is entitled, our splendid industry will go ever forward to new heights of achievement.

Redmond with Kansas Pipe Line and Gas Co.

The Kansas Pipe Line and Gas Company, through its President, Mr. L. E. Fischer, of 231 S. LaSalle Street, Chicago, announces the appointment of Mr. S. B. Redmond, of Salina, Kansas, as General Manager of its properties, effective September 1.

Mr. Redmond has been associated for many years in an executive capacity, with the Natural Gas Division of The Kansas Power and Light Company.

Mr. Redmond's new headquarters will be at Elm Creek, Nebraska.

See How Gas Fired Hot Waters are Made

The Hostream Heater Co., Cleveland, O., are issuing a series of four folders, printed in color, featuring various scenes of The Great Lakes Exposition being held in Cleveland, and inviting visitors at the Exposition to come to their plant and see how gas hot waters are made. Mr. C. A. Reiter, Sales Promotion Manager says they are conducting "open house" during the Exposition.

The Law of Eminent Domain

By Leo T. Parker
Attorney at Law, Cincinnati, Ohio

GAS companies, whether owned by municipalities or private corporations, find it necessary for various purposes, as when extending pipe lines, constructing new buildings, improvements, enlarging capacity and service, and the like, to purchase or condemn private property.

Considerable discussion has arisen, therefore, from time to time regarding the proper and correct method under various and all circumstances of determining the exact amount which reasonably may be expected to be paid the owner of private property.

It is well settled law that where an owner of private property refuses to sell his land to a gas company which by necessity or convenience requires the same, the latter may appropriate the property and pay a *reasonable* valuation therefor.

Condemnation proceedings, or the power to appropriate, are based upon necessity for the public good. In other words, the courts recognize the established law to be that all private property is held subject to use by the public when the public good requires it.

It would be unjust to the public that it should be compelled to pay to the owner more than a fair compensation for the loss sustained by the appropriation of his property for the general good.

On the other hand, it is important to know that while public service corporations are permitted to condemn and appropriate private property, and exercise the right of eminent domain, and thus acquire ownership in property against the owner's will, this right is the public interest, and *not* the private right of the public service corporation or its stockholders, which confers upon such corporations the right of eminent domain. In every instance it is the public interest, and not the private interest, that is important and which gives rise to the extraordinary right of eminent domain. Particularly because of this public interest the courts will not permit a private property owner to compel a gas company to pay more than a reasonable price for the appropriated land. Moreover, the reasonable value must be determined by *present* circumstances and *not* by speculative methods or likelihood of increased value, or uncertain losses.

For instance, in Yagel V. Kansas Gas Company, 291 Pac. 768, it was disclosed that the owner of private property endeavored to compel a gas company to pay valuation for appropriated land based upon the injury *likely* to occur in addition to the value of the land. The court refused to hold the gas company liable for an amount greater than the *actual valuation* of the condemned land, and said:

"It is the intent of the law that all the actual damages, which may naturally and proximately result by reason of the condemnation of a right of way for a public purpose across it, shall be paid to him. The law will not permit mere speculative elements of damages, based upon an ill-defined fear that at some unknown and indefinite time in the future some misfortune may come to some man or beast by reason of such improvement, to enter into the consideration of those who, under the law, are required to fix the amount of the damages."

Excessive Allowances Reversed

In all cases involving damages allowable to a property owner for use or appropriation of his land, the courts invariably hold that the amount of such allowance must be based upon the *actual* value of the property. Therefore, if the amount allowed by a jury or lower court does not conform with these legal rules, the higher court will reverse the verdict.

In other words, while it is settled law that a gas company is bound to pay the reasonable and presently established value of private property appropriated for its purposes, yet a higher court ordinarily will not approve a verdict for damages rendered by a lower court and based upon testimony by witnesses for the property owner in excess to the actual value of the land.

For example, in Natural Gas Company V. Alley, 25 S. W. (2d) 724, it was disclosed that a gas company condemned rights through certain farm lands for public purposes.

The land was fertile and capable of being cultivated. The lower court allowed $300 damages for one-fifth acre, basing its judgment upon testimony given by witnesses for the landowner. However, since this valuation amounted to $1,500 per acre, it is interesting to observe that the higher court reversed this decision, saying:

"Opinions were predicated upon the idea that the land was destroyed for all purposes insofar as the owner is concerned. Extravagant values were placed upon the land taken, and the consequential damages were equally exaggerated. . . . For the reasons the judgment is reversed because excessive."

In another leading case involving an excessive valuation, although a lower court allowed $500 to a farm owner for a strip of land twenty feet wide and 1,000 feet long, the higher court reversed the verdict saying:

"There is no evidence that any portion of the farm was taken or damaged by the construction except the strip twenty feet wide and fifty nine rods long through which the easement runs. . . . It is true this strip runs through the bottom lands of appellee's farm—the most fertile and best part of his land. But conceding all that the appellee says of its fertility, the court knows as a

matter of common sense that the price of $1,000 per acre which the appellee places on this bottom land is fantastic, and that agricultural land remotely situated as this is, even if it is on a county road leading to the county seat, is not worth any such price."

Of course, if the land is used merely for a pipe line, the gas company is not required to pay the full valuation of the land.

For instance, in Virginia Gas Company V. Hays, 37 S. W. (2d) 17, it was disclosed that a gas company condemned a strip of land sixteen feet wide and 1,900 feet long for use as a right of way for a gas pipe line. The county officials estimated the damage to the land at $197. The property owner was not satisfied with this allowance and he filed suit. The jury fixed the amount of damages at $500. The higher court promptly reversed this jury's verdict, and said:

"Less than one acre is taken for this easement. . . . Under the highest value fixed on this land, the strip taken for this easement would be worth considerably less than $100, and the owner is not deprived of the use of his land, but may cultivate and use it, subject to the easement of the company."

Valuation Determined

Seldom have the courts rendered an opinion containing such clearly understandable legal rules, regarding payment for condemned private property, as found in the leading case of Cushing V. Buckles, 273 Pac. 346.

In this case the property owner contended that the price he should receive for the property condemned for public purposes should be estimated in consideration of its value to the public service company rather than upon the actual value of the property. The lower court upheld this contention and allowed the property owner a recovery on the basis of the worth of the property to the company. The latter appealed to the higher court on the contention that the estimated amount due the landowner should not be based upon the value of the land for public purposes. In upholding this contention, the higher court reversed the lower court's decision stating important law, as follows:

"In estimating the value of property taken for public use it is the market value of the property which is to be considered. . . . The market value of property is the price which it will bring when it is offered for sale by one who desires, but is not obliged to sell it, and is bought by one who is under no necessity of having it. . . . In estimating its value all the capabilities of the property, and all the uses to which it may be applied or for which it is adapted, are to be considered, and *not* merely the condition it is in at the time and the use to which it is then applied by the owner. . . . In determining market value the value of the property to the owner, or the value which he places on it, cannot be considered. . . . Compensation must be reckoned from the standpoint of what the landowner loses by having his property taken, not by the benefit which the property may be to the other party to the proceedings. . . . Therefore the value of a particular piece of land to a person or corporation exercising the right of eminent domain . . . cannot be considered as an element of damage to the owner."

Common Method of Estimating Valuation

Ordinarily, the amount allowable for appropriation of private property for public uses, and where the company appropriates only a portion of the property, is the difference between the actual value of the property before and after the appropriation was made. In other words, various items cannot be separately considered.

For instance, in Jordan V. Clearfield, 164 Atl. 98, it was disclosed that a strip of land fifty feet wide was appropriated through a farm which resulted in necessity of moving a house thereon. When asking for damages the owner of the property contended that all items, including the damage to the house, cost of removal, trouble in cultivating to parcels of land, etc., should be considered separately. However, the court held that the damage award should be based on the difference in the value of the property before and after the appropriation, and said:

"The measure of damages was the difference in market value before and after the taking. . . . The law has fixed the measure of damages in eminent domain proceedings, and while it now permits one, who has testified to the value before and after the taking, to state in detail the elements, and their cost, which he took into consideration in arriving at his estimate, it does not receive them as specific items of damage to be separately considered by the jury in passing upon the damages to be awarded."

Unusual Damages

It is interesting to know that frequently unusual circumstances may arise, during appropriation or condemnation proceedings, which may result in greatly increased valuation allowances or damages.

For example, it is well to keep in mind that the higher courts consistently hold that a cemetery is created by a grant or deed from the owner, or a municipality may appropriate a particular plot of land for this purpose. On the other hand, the fact that a plot of land is *used* for cemetery purposes is sufficient to constitute a legal creation of a cemetery.

The acceptance of dedication, or use of land for burial purposes, gives the right of the living to place monuments or suitable decorations over the graves of their dead as memorials, and to preserve and beautify the premises. However, under all circumstances a cemetery remains a legal burying place unless (1) it has been permanently appropriated to a use entirely different and inconsistent with its purpose as a cemetery; or (2) where it has been so neglected as to lose its identity as a cemetery. The fact that grass, weeds, and trees are permitted to grow, or there are no monuments at the graves does *not* indicate that the cemetery is abandoned.

A gas company which appropriates cemetery property or in making improvements may be liable in heavy damages and additional damages for disturbing graves in a cemetery which is not abandoned.

For illustration, in Magnolia Gas Company V. Leach, 17 S. W. (2d) 471, the records disclosed that a gas company constructed a pipe line and while doing so its employes dug a ditch for the pipe line through an apparently but not actually abandoned cemetery. A grave was blown up and destroyed which contained the deceased daughter of a mother living in the community. The mother

sued the gas company for $1,000 ordinary damages, and $850 as exemplary damages.

The counsel for the gas company defended the suit upon the contention that the graveyard had been neglected and was overgrown with briars, grass and trees for which reason the graves could not be discerned, and that the company's employes did not discover the grave or know that it was located in the line of their right of way. However, since the cemetery had not been legally abandoned, the court held the gas company liable on the grounds that the employes were negligent in failing to discover presence of the cemetery. This court said:

"Was it negligence on the part of said defendant's (gas company's) servants, in the construction of its pipe line, to construct same through the premises in question? The jury further found that such negligence was the proximate cause of the destruction of the grave."

Land Illegally Condemned

Frequently, the situation is such that land is appropriated or used illegally. Under circumstances of illegal appropriation the gas company employes have no legal right to enter upon the property and doing so may result in the property owner being entitled to recover heavy damages.

Illegally entering private property may result where: the gas company officials have failed to comply with state laws regulating appropriation of private property; the gas company officials or employes did not abide by a court order; the company employes performed illegal acts injurious to the property owner; or the company employes trespass upon private property.

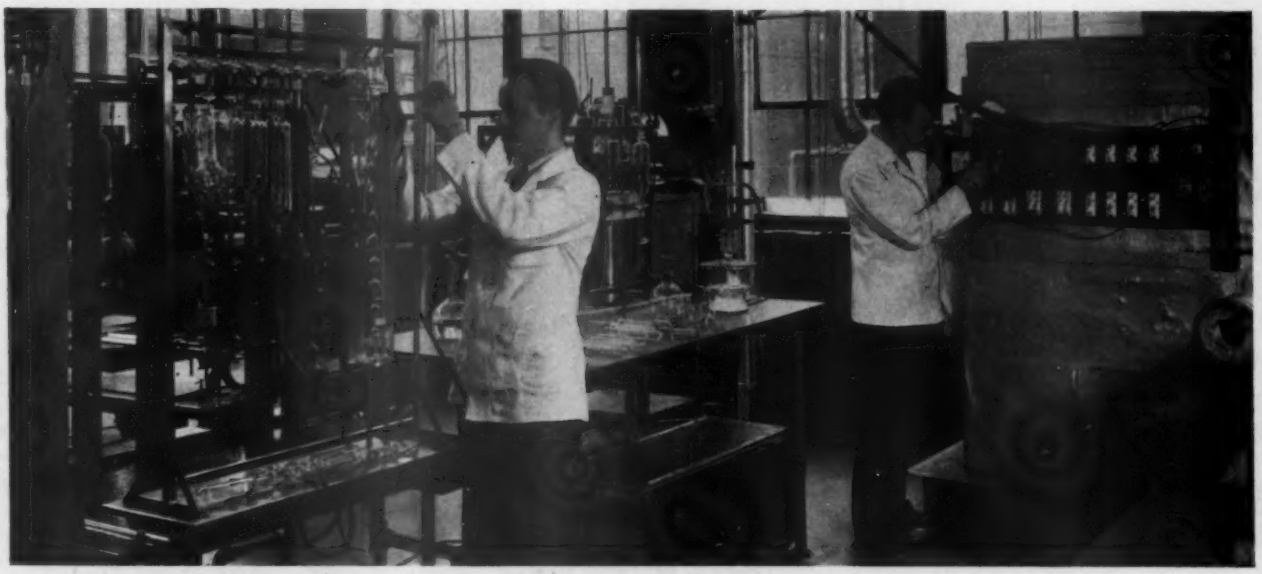
Also, it is important to know that some State Legislatures have enacted laws which prohibit corporations of other states from condemning and appropriating private property for public utility purposes.

However, a gas company which illegally, but in good faith, enters upon land may not be held liable in damages unless the property owner clearly proves that he suffered actual damages.

For example, in Southwestern Gas V. Patterson Orchard Company, 20 S. W. (2d) 636, it was disclosed that a gas corporation located in another state sought a right of way over land which it was unable to purchase by negotiation with the owner. The company filed with the clerk of the court, in the state in which the property was located, its petition to condemn the right of way, and deposited with the clerk a certain sum of money. The company then was given authority to enter upon the land and construct its improvement. Later it was discovered that the corporation was a foreign corporation and that it was not authorized under the state laws and constitution to condemn property.

The property owner sued the gas company for damages because it had illegally entered the premises. However, since the property owner did not prove that his property had been damaged, the court held the corporation not liable, and said:

"The power of eminent domain is expressly extended to companies organized in this state . . . but not to foreign corporations, the Legislature evidently considered that it had no power to do so without first requiring them to become domesticated. . . . Having obtained the order in good faith and having constructed the line pursuant to it, appellant (gas corporation) could not have been guilty of such a willful and malicious wrong by entering under a void order as to justify a recovery of punitive damages. It in good faith believed it had the right to enter, and there is a total lack of evidence of malice, either express or implied, which is necessary to support a recovery for punitive damages."



SPECIAL GAS ANALYSIS APPARATUS DEVISED FOR LABORATORIES' STUDIES

New equipment for micro-analyses of gas combustion products is being developed at the American Gas Association Testing Laboratories! These engineers are assembling especially built apparatus needed to probe the fundamental reactions of high-temperature, high-rate gas combustion under reducing furnace atmosphere conditions. Mere traces of oxygen and unburned or partially burned component gases must be detected and measured to establish basic laws.

Capacity Characteristics of Semi-Rigid Tubing

By

F. O. Suffron, Research Engineer

American Gas Association Testing Laboratories

IN recent years semi-rigid gas tubing has become a popular and convenient means of connecting domestic gas appliances to house piping. Probably the first widespread applications of copper and aluminum tubing in this field were the connection of gas refrigerators and space heaters. It is now common practice, however, to supply gas to other types of domestic appliances, particularly ranges and water heaters, through semi-rigid tubing.

Considering these many applications which present an extremely wide range of capacity requirements, it seems evident that selection of tubing for any particular installation should be premised on more accurate knowledge of tubing flow characteristics than the "rule of thumb" methods sometimes employed. To provide information necessary for the preparation of listing requirements for semi-rigid gas tubing by the Subcommittee on this subject under the chairmanship of Mr. C. B. Wilson, Arkansas Louisiana Gas Company, Little Rock, Arkansas, a three months' investigation of gas flow characteristics was recently completed at the Association's Laboratories. This information should aid in the selection of proper tubing sizes in the field for various applications in connection with gas appliances.

Certain results of this study are presented graphically in Figures 1 and 2. Figure 1 shows capacities for $\frac{5}{16}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ and $\frac{7}{8}$ inch O. D. tubing having the wall thicknesses indicated in table. It will be noted: (1) that the capacity range covered is from 10 to 1,000 cubic feet per hour of 0.6 specific gravity gas, (2) that capacities may be selected for pressure drops (or loss in pressure head) of from 0.1 to 1.0 inch of water in increments of 0.1 inch water column, and (3) that lengths of tubing for which capacities may be determined vary from 1 to 100 feet.

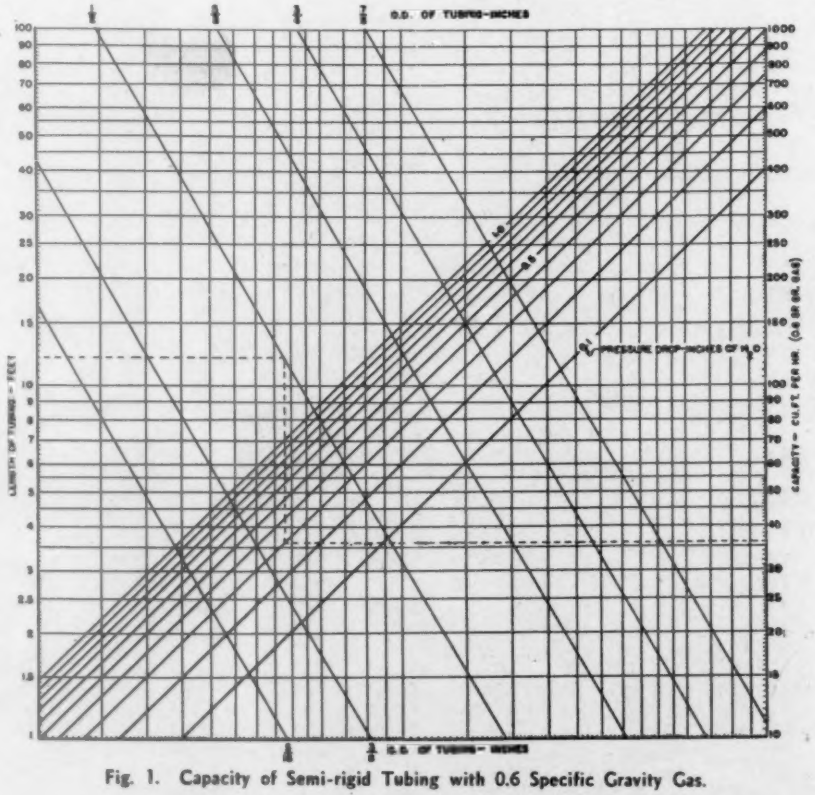


Fig. 1. Capacity of Semi-rigid Tubing with 0.6 Specific Gravity Gas.

In order to demonstrate methods of utilizing the chart of Figure 1 several examples will be given. If it is desired to determine the capacity of a 12-foot length of ½ inch O. D. tubing with a pressure drop of 0.3 inch of water, the following procedur as indicated on Figure 1 by the dashed line should be taken: (1) Project a horizontal line from the 12 foot point on the left-hand scale to the diagonal ½ inch O. D. tubing diameter line; (2) project a vertical line from this intersection to the diagonal 0.3 inch of water pressure drop line; (3) project a horizontal line from this intersection to the right-hand scale and read capacity indicated. It will be noted that the indicated capacity in this case is slightly over 36 cubic feet per hour of 0.6 specific gravity gas. If the gas to be employed has the same gravity (0.6) and a heating value of, for example, 550 Btu. per cubic foot, then the capacity in Btu. per hour will be 550 x 36 x 19,800. If, however, the gas distributed had a specific gravity other than 0.6 it would be necessary to correct the capacity

selected from the chart in accordance with the following equation:

$$Q_1 = \frac{0.775\ Q_2}{\sqrt{\text{sp. gr.}_2}} \text{ (Approx.)} \quad (1)$$

Where:

Q_1 = capacity with gas distributed, cu. ft. per hour,

Q_2 = capacity selected from chart, cu. ft. per hour, and

sp. gr.$_2$ = specific gravity of gas distributed, (air = 1.0)

Thus, if the gas distributed had a specific gravity of 0.4 the corrected capacity would equal $\frac{0.775 \times 36}{\sqrt{0.4}}$ or 44 cubic feet per hour. On a heating value basis the capacity as corrected would be 44 x 550 or 24,200 Btu. per hour for the 550 Btu. gas.

Another practical use of Figure 1 is illustrated by the following example. Assuming it is necessary to install an appliance with a manufacturers rating of 19,800 Btu. per hour in a territory where a 550 Btu 0.6 specific gravity gas is distributed, the first step required in determining adequate tubing sizes would be to convert the Btu. rate to a volume basis, or 19,800 divided by 550 would equal 36 cubic feet per hour. Next, an intersection with a diagonal pressure drop line should be determined by projecting a horizontal line to it from the 36 cubic foot point on the right-hand scale. Assuming a permissible drop of 0.3 inch of water as in the preceding example, the resultant intersection is that shown by the dashed line in Figure 1. A vertical line projected above and below this intersection will indicate the maximum length of various diameter tubings which can be employed and satisfy the foregoing requirements of capacity and maximum premissible pressure drop. For example, the vertical dashed line meets the ½ inch O. D. tubing line at a point identified with a tubing length of 12 feet. Consequently, as much as 12 feet of ½ inch O. D. tubing would be satisfactory. If this vertical dashed line is continued so as to intersect the diagonal ⅝ inch O. D. tubing line it will be found that about 47 feet of this sized tubing would also comply with the capacity (19,800 Btu. per hour) and pressure drop (0.3 inch of water) requirements set forth above.

TUBING DIMENSIONS

O.D. Nominal	*Wall Thickness*	*I.D.*
¼	0.035	0.1812
5/16	0.037	0.2385
⅜	0.046	0.2842
½	0.0515	0.397
⅝	0.0515	0.522
¾	0.0588	0.6305
⅞	0.065	0.746

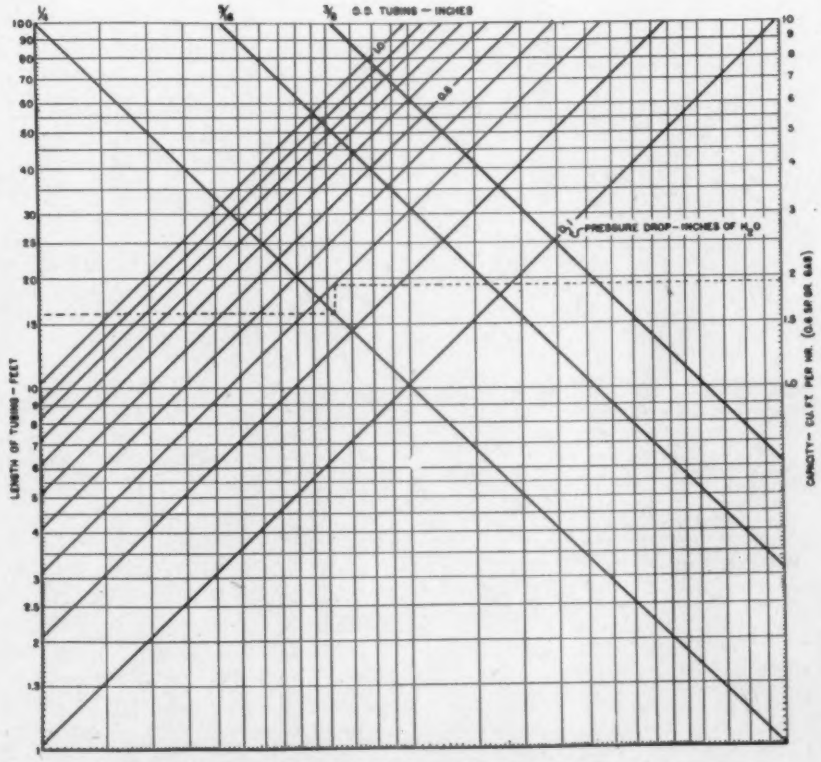


Fig. 2. Capacity of Semi-rigid Tubing with 0.6 Specific Gravity Gas.

In the preceding example, it was assumed that the gas distributed had a specific gravity of 0.6, the value employed in construction of Figure 1. If the actual specific gravity differed from this value, it would be necessary to correct the volume to the equivalent of 0.6 specific gravity gas before the chart of Figure 1 could be employed. This correction may be made in accordance with equation (1) or the following modification:

$$Q_2 = 1.29\ Q_1 \sqrt{\text{sp. gr.}_2} \text{ (Approx.)} \quad (2)$$

Where:

Q_2 = capacity to be used with chart (corrected to 0.6 sp. gr. gas), cu. ft. per hour,

Q_1 = capacity with gas distributed, cu. ft. per hr., and

sp. gr.$_2$ = specific gravity of gas distributed (air = 1).

Thus, if a 550 Btu. 0.4 specific gravity gas were distributed and an appliance requiring 24,200 Btu. per hour (44 cubic feet per hour) were to be installed, the corrected capacity to be used with the chart would be 1.29 x 44 x $\sqrt{0.4}$ or 36 cubic feet per hour. Appropriate diameter and length of tubing for this capacity may be found as outlined in the preceding example.

The chart of Figure 2 is similar to Figure 1, except that the capacity range is from 1 to 10 cubic feet per hour and only ¼, 5/16 and ⅜ inch O. D. tubing are shown. This chart should be utilized in the same manner as Figure 1.

For most proposed installations, length of tubing, gas burning capacity of the appliance, heating value of the gas, and the specific gravity of the gas are known, or readily determined. Thus, there remains only the problem of establishing a suitable limit for permissible pressure drop in order to be able to determine the proper tubing diameter from Figures 1 or 2.

Although a value of 0.3 inch water

column pressure drop was employed in the previous examples it should not be construed as a recommendation for all cases. Permissible pressure drop for the tubing will depend on distribution pressure available, on the pressure drop or capacity of the piping and various controls on the appliance to be installed, as well as on the performance characteristics of the appliance itself. As a consequence, some latitude should be allowed in evaluating permissible pressure drop for unusual cases. In general, however, and particularly where the capacity of appliance controls cannot be accurately estimated or where the gas pressure at the service is not known, a value of 0.3 inch water column would seem to afford a satisfactory compromise.* Rarely should it be necessary to employ a lower pressure drop and it can often be exceeded without impairing the service expected from the appliance.

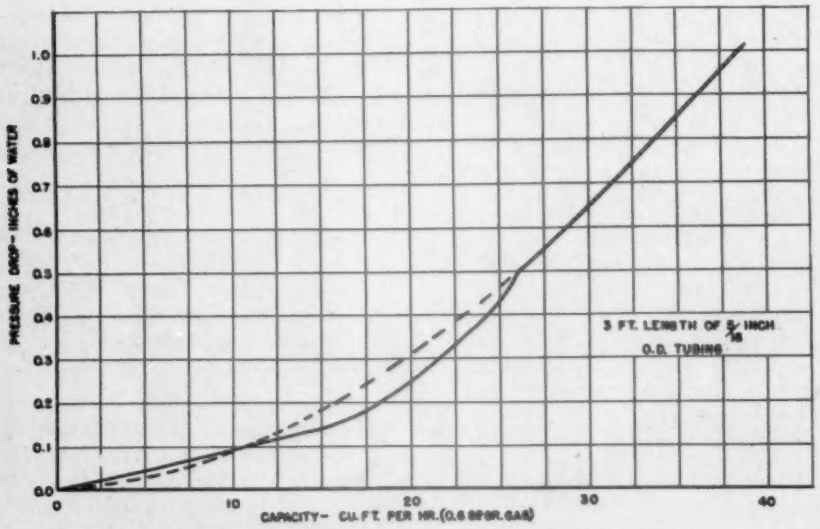


Fig. 3. Capacity-Pressure Drop Characteristics of Semi-rigid Tubing.

It is believed that proper use of Figures 1 and 2 will permit sufficiently accurate selection of tubing diameter for all practical applications in the connection of domestic appliances to house piping. As a matter of general interest, however, other findings made during the investigation will be presented briefly.

Among the several variables affecting gas flow is the internal area or diameter of the conduit. It will be noted that the various diameter tubings shown as Figures 1 and 2 are identified by their outside diameter. Strictly speaking, these capacity lines apply, therefore, only to tubing having the same I. D. as the samples tested and as indicated in Table of Dimensions. Consequently, capacities of tubing having other wall thicknesses would not be the same as indicated by use of the charts. In order to determine capacities for semi-rigid tubing having a given inside diameter, the following general equations may be employed.

For capacities above 10 cubic feet per hour:

$$Q = \frac{2550\ D^{2.68}\ P_d^{\frac{1}{1.8}}}{L^{\frac{1}{1.8}}\ S^{\frac{1}{2}}} \qquad (3)$$

Where:

Q = capacity, cubic feet per hour,
D = inside diameter of tubing, inches
P_d = pressure drop, inches of water
L = length of tubing, feet, and
S = specific gravity, (air = 1.0)

For capacities below 10 cubic feet per hour:

$$Q = \frac{96{,}300\ D^4\ P_d}{L} \qquad (4)$$

It will be noted that equation (3) which satisfied experimental data (except for specific gravity the function of which was assumed) follows quite closely certain general equations for turbulent flow of fluids in pipe.** Equation (4) is, on the other hand, a modification of Poiseuille's law (assuming absolute viscosity of gas constant at 0.011 centipoises). Experimental data were exceptionally consistent with this latter equation which governs streamline flow.**

Results obtained on several sizes of tubing when gas flow was varied from flow in the streamline region to flow in the turbulent zone are typified by those obtained on the $\frac{5}{16}$-inch size as portrayed in Figure 3. It is apparent that up to a flow of about 11 cubic feet per hour, the quantity of gas passed was proportional to the pressure drop, or $\frac{Q_1}{Q_2} = \frac{P_{d1}}{P_{d2}}$. For flows above this value to about 27 cubic feet per hour the relationship between capacity and pressure drop was variable. A comparable unstable region of viscous-turbulent flow was observed on all sizes tested. Above a gas flow of 27 cubic feet per hour the relationship between capacity and pressure drop again became definite following the law

$$\frac{Q_1}{Q_2} = \left(\frac{P_{d1}}{P_{d2}}\right)^{\frac{1}{1.8}}$$

The dashed line in Figure 3 extending to the left and below the 27 cubic foot point defines the capacity-pressure drop relationship for this region in accordance with this latter equation and on the basis of observations in the turbulent flow region. On Figure 1 capacities for $\frac{5}{16}$ inch size correspond to values indicated by this dashed line on Figure 3 from 27 to 10 cubic feet per hour, rather than actual observations in this unstable

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** This value (0.3 inch pressure drop) is used as basis for capacities of house piping in A.G.A. Requirements for House Piping and Appliance Installations 1928, pages 2 and 3.*

*** Of the very extensive literature on flow of fluids in pipe the following few references are selected on the basis of their probable accessibility to members of the gas industry:*

(a) A.G.A. Industrial Gas Series Combustion, 3rd Edition, pages 29, 30, 70, 71.

(b) Flow of Natural Gas Through High Pressure Transmission Lines, Monograph 6, U. S. Department of Interior Bureau of Mines.

(c) Kent's Mechanical Engineers Handbook, Tenth Edition, pages 668 to 677; 904 to 906.

(d) L. S. Marks' Mechanical Engineers Handbook, 2nd Edition, pages 369, 370.

range as indicated by the solid line. As a consequence use of the chart (Figure 1) in this unstable range will indicate lower capacities than would actually prevail with a given length of tubing and pressure drop. For example, from Figure 1, a 3-foot length of $\frac{5}{16}$ inch O. D. tubing would indicate a capacity of about 20 cubic feet at a pressure drop of 0.3 inch of water. This result coincides with that given by the dashed line on Figure 3 for a corresponding pressure drop of 0.3 inch of water. The actual capacity from the solid line on Figure 3 would be 22 cubic feet. Inasmuch as the error introduced is small and since the error is on the safe side from the standpoint of appliance performance, the assumption on which Figure 1 was premised, namely that turbulent flow exists down to a critical velocity identified with 10 cubic feet per hour, seems to be warranted.

It is interesting to note that the critical velocity (the intersection of the curves for turbulent and streamline flow) yielded a value of about 11 cubic feet for $\frac{5}{16}$ inch tubing (Figure 3) a value which is in close agreement with theoretical concepts.

As would be expected, capacities of aluminum and copper tubing were similar when the inside diameters of the samples tested were identical. This was borne out from test data on four sizes of tubing composed of copper and two grades of aluminum. It is evident that one curve best satisfies the observed points for all three kinds of material employed. As a consequence, no consideration need be given to type of material in the selection of tubing from the standpoint of capacity.

All results thus far presented were obtained from tests on straight lengths of tubing. Bends, such as are necessary in field installations will, of course, restrict flow to some extent. Results obtained for $\frac{5}{8}$-inch tubing indicate the effect of bends to be slight, provided that the bends are carefully made so as not to reduce cross-sectional areas materially. Calculated reductions in cross-sectional area produced by bends in the samples tested did not exceed 2 per cent of the original cross-sectional area. Although some correction should be made for bends in a precise analysis, the practical needs of appliance installation do not demand such corrections provided reasonable care is exercised in forming the bends.

Pressure drop-capacity characteristics of fittings also were studied during this investigation. For the type of fittings employed, the capacities observed at various pressure drops were substantially equal to an equivalent length of tubing of the appropriate diameter. It was noted that the I. D. of tubing and the fittings in all cases were practically identical. For installation purposes, therefore, the lengths involved should include the fittings at both ends, and the capacities selected from Figures 1 and 2 should be taken for such total lengths.

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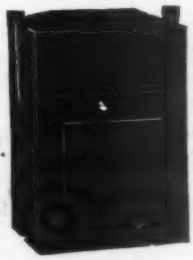

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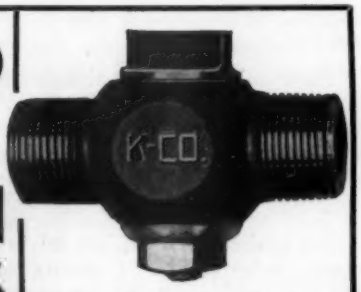

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AS THE EDITOR SEES IT

Convention Time Approaches

THE Eighteenth Annual Convention of the American Gas Association and the First Exhibit of the Association of Gas Appliance and Equipment Manufacturers will be held at Atlantic City during the last week in October.

Occasionally a Gas Convention is held in some other place, but always it comes back to Atlantic City. We are glad to see it there again. To most of us the event and the place are associated with helpful information, constructive action and pleasant times. Nowhere but in the Convention Hall would the Exhibit of Gas Equipment and Appliances appear natural. So it seems as if the Convention were returning home to Atlantic City.

At this time it is natural that there should be considerable ballyhoo and inspirational publicity. In effect, each gas man is urged to reserve a place for himself on the band wagon, alias the railroad train, or to see that the tires on the family car are strong enough for a trip to the "Play City" of the east. Worthwhile papers, an interesting exhibit and a pleasant time are assured.

Such publicity is an absolutely necessary preliminary to a successful convention. We need more of it in the gas industry, particularly in advertising our service to the public. Appeal to the imagination will overcome obstacles, where a dispassionate statement of facts will fail.

We realize all this, but nevertheless we look at the matter a bit coldly. It seems to us that attendance at the Convention should be regarded as an investment which should pay a return. Many presidents and general managers will doubtless view it in the same way when deciding which employees shall be sent. In some cases the justification may be an improved morale, in others a broader general outlook and in still others the acquisition of specific information on local problems. More likely it will be a combination of all three. In any case a benefit to the company will be expected.

The gas industry is engaged in the keenest kind of competition in every branch of its business. It needs the fullest and most intelligent cooperation of every one from president all the way down the line. Here is a real opportunity for the ambitious employee to gain in knowledge and broaden his view. Each one who goes to the Convention should realize not only the opportunity to improve himself but also the responsibility to acquire something that will help his company.

Much has taken place in the gas industry since the Convention last year. The National Advertising Campaign which was then proposed has become an accomplished fact. National advertising, however, is but one phase of the publicity needed by the gas industry if the competitive situation is to be met effectively. What gas companies should do individually in order to realize maximum benefit from national advertising will undoubtedly be discussed very fully.

Competition has become more keen, but sales of appliances and number of customers have nevertheless shown gratifying increases. Ways and means to deal with the situation most effectively and secure an even greater share of the available business in the future will be considered.

The Exhibit should be an item of special interest. It will be the first held under the auspices of the Association of Gas Appliance and Equipment Manufacturers; and the industry may rest assured that no effort will be spared to make it better than any heretofore.

During the past two years the manufacturers have been doing outstanding work in research and in the development of more efficient apparatus and equipment. Many of the improvements will yield substantial savings in operating costs or will give better control or better economy in utilization.

While sales of appliances are increasing, competition is very keen, and every gas company should be familiar with the very latest and best types available to meet various conditions most effectively. Furthermore, competition makes it imperative that operating costs be cut to a minimum. Equipment manufacturers have been devising ways to do this and a few of the developments are quite revolutionary.

It must be remembered that the Association of Gas Appliance and Equipment Manufacturers was formed largely to enable its members to work out their problems more effectively than they could as a section of the American Gas Association. They have been quietly but actively at work; and what they have accomplished may be seen at Atlantic City next month.

The last few years have seen many changes in the gas industry. Much of the old conservatism has dropped away. A new aggressive spirit and more liberal policies have taken its place in advertising, in sales and rental plans and terms of credit, in rate forms and structures and in the handling of many problems of manufacture, distribution and utilization.

The Convention is the annual gathering of the gas industry where its problems are discussed, where new developments make their appearance and where the spirit of the industry is disseminated. No other event during the year can take its place. Those of our readers who are seriously interested in helping themselves and their companies should attend the Convention and the Exhibit. It should be a sound investment.

Pipe Corrosion and Coatings

By

Erick Larson

Gas Engineer

Part 3

Electrolysis

THE Electro-chemical explanation of chemical reactions is frequently confused with that same theory's explanation of the phenomena designated by the general term electrolysis. Both involve electrical phenomena but the Electro-chemical theory is more analogous to the static phases of electricity than is electrolysis, where actual flowing currents of a measurable quantity are encountered. In chemical reactions, charged particles of opposite polarity may have a magnet-like attraction for each other during union or neutralization of the charges, while in electrolysis a current conveys the particles.

The identical appearance of the corrosion from chemical reactions initiated by local factors, explained under Electro-chemical theory and electrolysis, has also resulted in the term electrolysis being applied to both types of corrosion.

Electrolysis is subdivided into galvanic and stray current. To distinguish between the two is important in the mitigation of corrosion.

Galvanic Action

Electrolysis is the transposition or transfer of a metal by means of an electric current. Electrolysis may also be described as the separation of a metallic mass or compound into its electrolytic constituents by an electric current and the products are negative and positive ions. The Electro-chemical theory explains why dissimilar metals corrode into electrolytes. Galvanic or battery action is a phenomenon resulting when two dissimilar metals and a conducting liquid or electrolyte are placed

The destructiveness of galvanic corrosion.

together so as to form a battery or cell, and inherently have the ability to generate an electrical current, which current will convey the metal from the anode or positive pole through the solution, and deposit or give off hydrogen on the cathode or negative pole. This latter feature is one of several distinguishing galvanic or battery actions. The flow of current in a galvanic cell is the result rather than cause of corrosion. Stray current electrolysis is the loss of metal from a structure whose electrical potential exceeds that of the surrounding medium, due to a current generated at some foreign or remote point being conveyed by the structure affected or adjacent electrical conductor, to the point at which the action occurs.

Galvanic action results in the generation and flow of an electrical current within a closed triangular system consisting of two dissimilar metals, or a single metal in two dissimilar physical states, immersed in or connected by an electrolyte.

Electrolytes

An electrolyte is a liquid or solution capable of conducting electricity and which may be chemically decomposed by an electric current. Pure compounds such as water, alcohols, ethers, acids, esters, aldehydes, ketones, mercaptans, hydrocarbons, and the chlorides, bromides, iodides, sulfides, oxides of non-metallic elements even in the liquid state, but not in solution, are poor conductors. Solutions of many acids, bases and salts in water, liquid ammonia, amines, liquid hydro-cyanic acid, alcohols, esters, etc. are excellent electrolytes. The conductivity of electrolytes varies inversely with the concentration as shown by the following table which indicates the conductance of acetic and hydro-chloric acid for various concentrations.

	Concentration Factor	Equivalent Conductance of Aqueous Solutions at 18° C.
Acetic Acid	0	347.0
	10	14.5
	30	8.5
	80	5.22
	100	4.67
Hydro-chloric Acid....	0	379.0
	2	373.6
	10	368.1
	80	353.0
	100	350.6

The conductance being greater for weak solutions, corrosion is usually rapid on pipe lines subject to galvanic action, as most electrolytes occurring in nature are of a weak concentration.

Galvanic Currents

All metals have their individual electrical potential or solution pressure, which is of a different value than any other metal, and therefore, the differential of potential between the two metals causes an actual flow of current. The direction of flow is of vital importance in the mitigation of corrosion, as the metal having

the higher potential and, therefore, the one from which the current leaves the structure, is corroded by the current discharging some of the metal from the positive or anodic pole to the electrolyte. The amount of metal that is transposed follows Faraday's Law, which states that corrosion is proportional to the quantity of electricity passing through a circuit. Galvanic action requires an electric current, and progressive corrosion from that agent requires sustaining the flow of current. Polarization and electrical resistance interfere with the flow of electric current between the metals and frequently discontinue the current entirely. Some couples composing a galvanic cell may produce corrosion initially, but the rate becomes progressively less, and eventually the action is discontinued before the result has been practically detrimental. A compound is not transposed by a galvanic current but is decomposed into its component parts, and the metal carried from the pole of positive polarity to the relatively negative pole, or cathode. The same action occurs when two metals, or a metal and other element or compound is intimately mixed in what appears to be a uniform metal. An example would be bronzes and cast iron. Electrolysis would produce dezincification of the bronze and graphitization of the cast iron.

Rate of Galvanic Corrosion

There are varying degrees in the ability of two metals and an electrolyte to generate a current. Some metals may be used with no practical effect, while others will corrode excessively. For each particular electrolyte, metals may be arranged in an electromotive series similar to that given under the discussion of electro-chemical theory. Galvanic cells composed of one metal near the top of the electromotive series, paired with a metal near the bottom, will develop more electrical potential difference than any two closer together in the list. The particular sequence of the metals in an electro-motive series may not be similar for two different electrolytes, and therefore tests must be conducted for each particular combination. However, the following sequence applies in general, for but few metals will change places under most circumstances found in practical conditions. Unless affected by foreign influence, metals will enter solution in the presence of an electrolyte at rates proportional to the relative positions in the electro-chemical series, commencing with the most rapid loss of the top metals. The top metals also have the tendency to oxidize more rapidly than those lower in the list.

Polarization has been mentioned as decreasing the effect of galvanic action. Oxygen is a depolarizing agent, as is also agitation of the electrolyte and, therefore, the existence of either of these two agents facilitates the flow of current.

All waters, natural or distilled, will conduct an electric current and, therefore, are electrolytes. The ability of an electrolyte to conduct a current is considerably altered by impurities, whether the impurities naturally exist as a gas, liquid or solid. For example a natural or distilled water containing oxygen, offers less resistance to a current than one free of air or oxygen. Salt impurities particularly increase the ability of waters to conduct a current. Any increase of an electrolyte's ability to conduct current will increase the rate of corrosion from electrolysis. The magnitude of the effect of aeration of water on electrolysis may be judged by the following table.

TESTS ON ELECTROLYTIC CORROSION OF METALS IN WATER AT 190° F.*

Test Metals in Contact	Average Corrosion Loss in Milligrams per 200 hours—per 12 sq. in. area Test Water Not Aerated	Test Water Aerated
Brass	10	16
Solder	9	29
Iron	55	900
Copper	9	14
Solder	10	30
Iron	55	2590

An insufficient quantity of or changes in the composition of an electrolyte affect its ability to generate and conduct current, and may even change the direction of flow. An example of the change in direction of flow is a cell consisting of iron, fruit juice, and tin. In this instance the iron is anodic when the juice contains dissolved air, and cathodic when the juice is air free. From the electro-motive series it may also be determined that a cell consisting of zinc, sea water and copper will develop a greater electrical potential than lead, sea water and copper and, therefore, zinc would be more rapidly corroded than lead.

Corroded End (Anodic)	Soft Solder
	Tin
Potassium	Lead
Sodium	Nickel
Barium	Hydrogen
Strontium	Bismuth
Calcium	Brasses
Magnesium	Bronzes
Aluminum	Monel
Duralumin	Copper
Manganese	Antimony
Zinc	Mercury
Cadmium	Silver Solder
Iron	Silver
Chromium Iron	Gold
Chromium Nickel Iron	Carbon
Cobalt	Protected End (Cathodic)

Though some metals may be below others the important consideration is the relative corrosive activity. Some of the metals may be grouped, and the metals in a single group, and occasionally immediately adjoining groups, may be connected and immersed in an electrolyte without the corrosion being of consequence. A series of groups for diversified sulphuric acid solutions is as follows:

Corroded End (Anodic)	Tin
	Lead
Aluminum	
Duralumin	Nickel
Zinc	Brasses
Cadmium	Bronzes
	Monel
Iron	Copper
Chromium Iron	
Chromium Nickel Iron	Silver Solder
Soft Solder	Protected End (Cathodic)

* *From "Corrosion Plays a Minor Part in Radiator Solder-Seam Failure," by W. H. Wilson, National Carbon Co., Inc., in July* 18, 1931, *issue of Automotive Industries.*

(Continued on page 24)

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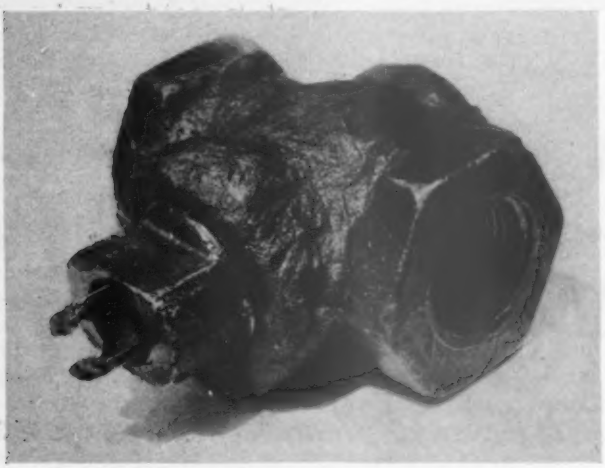
Physical contact in the electrolyte between the metals of a galvanic cell provide conditions more favorable to corrosion than when the metals are physically separated, but connected by a short low resistance electrical conductor, which conductor completes the necessary electrical circle from anode through the electrolyte to cathode, and returning through the external conductor. This fact is important in pipe line corrosion, as in most instances the two metals involved are physically attached to each other. For instance, a galvanized fitting may be attached to plain steel or iron pipe, and from the sequence of metals in the electro-motive series, zinc being above iron, the zinc would be corroded from the fitting, thus protecting the iron pipe. Were the zinc fitting and steel pipe physically apart in the electrolyte, the intervening distance might cause a greater resistance than the current could control. In sub-surface corrosion, practically all galvanic action occurs where the metals involved are in physical contact. The zinc and iron are not widely separated in the sequence of metals



The result of galvanic corrosion between the brass core, cast body and steel lubricating screw of a service stop.

in the electro-motive series, and therefore, the potential difference between the two is not as great as would occur if the pipe were copper rather than iron.

The decided effect on corrosion, when metals are separated or physically connected, is evident from the following test.

Metals submerged in solution	Grams loss in weight			
1. Zinc and copper (separated)	Zn. .0969	Cu.	.0257
2. Zinc and copper (connected)	Zn. .4780	Cu.	.0074
3. Zinc and brass (connected)	Zn. .0894	Brass	.0176
4. Zinc and zinc (connected)	Zn. .0753	Zn.	.0791

From "Galvanized Tank Corrosion on Automatic Water Heaters," by A. F. Craver.—American Gas Journal, April, 1936.

This test was conducted under conditions which would produce comparative but not scientifically accurate results. The test also demonstrates the relative corrosion of both poles. It is interesting to note that under conditions favorable to galvanic action in the zinc-copper cell, the zinc corroded five times as rapidly as occurred with a separation of metals, while the comparative figure for copper was only three. The tabulated losses secured through such laboratory tests are seldom comparable with actual experience, but usually represent the maximum affect under the most favorable conditions. When losses are greater than laboratory studies indicate, other factors exist than those used in research or in practice, a concentration of corrosion may occur which is difficult to duplicate in a test.

The distance separating two metals composing a galvanic cell is important, as the rate of galvanic action decreases with increased distance. This effect of distance is particularly noticeable in practical conditions, as it has been noted that galvanic action seldom extends more than a few inches from the location where the metals are in contact. For instance if an iron pipe is connected to a copper pipe, the iron being above copper in the electro-motive series tends to corrode, but the distance from the actual contact with the copper to the farthest point at which iron has left the anode seldom exceeds 2 to 3 inches. Where metal sub-surface structures of other utilities are adjacent to those of a gas distributing company, galvanic action may be discarded as a reason for corrosion if the metals are separated by any more than a few inches.

A frequently encountered corrosive area is a salt water marsh. In salt water, zinc is anodic to iron, and therefore zinc will deteriorate more rapidly than the iron, although a simultaneous corrosive action will occur, in which the iron will also be affected.

The relative area between anode and cathode is important, as a comparatively large area of anode, while not changing the total loss, results in a diffusion of the action which decreases the intensity of metal loss from the anode, or decreases the rate of pit depth formation. A common example of the affect of area is found on pipe surfaces covered with scale. Pipe scale is ordinarily electro-negative to the base metal and, therefore, where a small break in the continuity of pipe scale occurs, an intense concentration of corrosion occurs, producing a rapid pitting when conditions are favorable for electrolysis.

Metals Affected

The term "dissimilar metals" has been used in defining galvanic action, but dissimilarity is not necessarily entirely different metals, as the reaction may occur between impurities in a metal and metal itself, between the pipe scale and the pipe metal, between the carbon and iron in a cast iron pipe, or from a difference in potential in the metal itself, caused by varying degree of physical stress within the metal. An illustration of this latter condition is the greater rapidity with which bare cold driven rivets are corroded, while the surrounding metal remains unaffected particularly in atmospheric conditions. The rivet being stressed by the driving becomes anodic to the plate itself, and the essentials of a galvanic cell are present. The cold bending of pipe, without subsequent annealing, may produce conditions favorable for galvanic action. The metals composing a galvanic cell are not necessarily an integral part of the gas system, as contact with, or close proximity to, other electrical conductors such as metallic water, sewer, telephone, telegraph, electric, police and fire alarm, vehicular control, pneumatic mail and other systems, in conjunction with gas lines, would provide to the three essentials.

It is evident from the above discussion of the causes of galvanic or battery action, that many failures due to corrosion may be attributed to the design and methods used in installing pipe lines and services. A soil may be particularly non-corrosive electro-chemically, and yet with the installation of dissimilar materials, the soil moisture may provide the necessary electrolyte to produce a galvanic cell. The cause in this particular condition could not be attributed to soil corrosion, although

(Continued on page 43)

Sales Possibilities in Several Important Commercial Fields

J. F. Quinn

Supervisor, Commercial Gas Sales,
The Brooklyn Union Gas Co., Brooklyn, N. Y.

SEVERAL years ago the Managing Committee of the Industrial Gas Section christened our new born child "Retail Industrial Sales." During the author's term of office as Chairman of the Industrial Section, he rechristened it and called it by its right name: "Commercial Gas Sales."

There has been considerable said today regarding Commercial Merchandise and Commercial Gas Sales. Various pieces of equipment have been described but I will mention a few others later on.

I believe it is high time that we define "Commercial Gas Sales" in order that you and I will be talking the same language, and that the manufacturer of gas burning equipment will also understand what we mean and what we want.

Definition: *Commercial Gas is that gas sold to the neighborhood trade dealer, store or establishment, and that in itself, by the nature of its business, renders service to the public such as hotel, restaurant, institution, cafeteria, lunch room, tea room, delicatessen, bakery, beauty parlor, tailor, garage, gasoline station, etc. It is not a place that manufactures the product—this would be an Industrial Plant.*

In order to sell Commercial Gas intelligently, you must first have the sales organization properly set up to secure and hold gas sold on your lines. This means your company must establish a policy for the Commercial Gas Sales Division just the same as your company has established policies for the Domestic and Industrial Sales Divisions.

Next, you must get from your own company's records, a breakdown of the number of commercial accounts under this classification, the present gas sales per year in M.C.F., and what the gross annual revenue is from this classification.

Read at A. G. A. Industrial Gas Section meeting May 25, 26 at Washington, D. C.

Your next step should be to give a great deal of thought to some incentive for the salesmen in addition to salary. This will pay dividends to the management and stock holders. Set up your division so that all gas sold under this classification will be sold by commercial salesmen. Let the engineer do the necessary engineering and calculations for the proper carrying on of this work. Let the salesmen sell, sell, sell and do more selling.

The commercial gas load connected to any gas utility's pipe lines is its most profitable load—barring none; particularly so in the manufactured gas industry.

It happens to be my good fortune to know of several companies where the percentage of total send out is broken down about as follows:

80%	Domestic Gas Sales
17%	Commercial Gas Sales
3%	Industrial Gas Sales

It is true, however, that the greatest gas sales per meter are industrial—commercial gas sales per meter are in second place, and domestic gas sales per meter are the smallest. A commercial gas account has a very good load factor and is a good barometer as an indicator of business conditions. For example: when the purchasing power of the public is reduced, it reflects first on the commercial establishment.

Management can assist the commercial sales force considerably in the sale of gas and merchandise if serious consideration is given to trial installation of equipment with specific guarantees as to savings, low down payment on merchandise and long terms to the purchaser. Also, serious consideration must be given to underwriting dealers' paper on the prospects they sell, providing the prospects' credit is passed by your Credit Department. Do not penalize your dealers for repossessed merchandise.

With such policies established, it then becomes the management's duty to set up the wheels of progress, which consist of a sales organization, and it must be just what the name implies. The salesmen should know what they are selling and they should have ability and personality. I would break this down in the following manner:

80% knowing
20% personality

While considerable has been said regarding commercial merchandise which we have for sale, let me just say this—the manufacturer of various pieces of small equipment should put new skirts on the lady so that she will have eye appeal. Let us be proud of the equipment we sell and connect to our lines. As a result, the manufacturer will reap the harvest and we will be proud of the equipment sold and the load will be more secure.

It has been my good fortune during the past year to bring this idea before several manufacturers of gas equipment with fair results. You and I should not become price conscious, as our competitors do not hesitate when it comes to price. Their goods have quality and eye appeal. In other words, if we want quality, efficiency and eye appeal, let us go out and get it.

Recently in our territory, the first "Perfect-Bake" oven to be manufactured by the Crawford Oven Company, New Haven, Conn., which was designed and patented by R. H. Staniford and C. W. Roll of The Brooklyn Union Gas Company, was put into operation at Sears Tea Shoppe in Brooklyn. This is a three deck oven—one roasting and two baking sections. Each deck is a separate and complete oven by itself with top and bottom heat and top and bottom temperature control in each deck. Each section is separately vented and has no refractory in the baking chamber, so that the temperature can be raised or lowered quickly as one desires. Because of the segregated top and bottom heat control it is possible to attain any baking or roasting conditions. All classes of goods

are baked directly on the hearth and it is unnecessary to shift the goods. In addition to all the fine qualities of the baking and roasting chambers, it has eye appeal and does not look like a conventional gas appliance. It looks more like a Rolls Royce.

We now have proper gas coffee brewing equipment. The Silex Company and others have recently redesigned their gas hot plates for the brewing of coffee. They advertise their gas equipment nationally. You should help manufacturers place these appliances on your lines as you well know it is a large number of small accounts, particularly of this type, that count.

Another example is the Welsbach Company which has developed a counter broiler which will help get this type of business and replace those electric broilers on your lines. In addition to this manufacturer there are several others who have developed similar appliances—so, you now have tools. Go get the business!

Hair dryers have been developed for beauty parlors. They are fast replacing obsolete equipment and electric hair dryers. For this class of business, we have proper types of water heaters, space heating equipment and space cooling equipment. Every establishment of this type is a prospect for you, and a good one, too.

The tailor shop—we must do something at once to improve the efficiency of the present gas fired steam boilers on pressing machines. I recommend that your company establish a policy of expending approximately $10 to $15 a boiler to improve its condition. This will save the gas load and keep competitors out.

A considerable number of electric tailor irons are in use. You can replace every one of them, from an economical point of view, if you will replace them with "Goose Iron" tailor stoves. You have this tool—use it!

The small laundry either does their own wash or sends it to a wet wash laundry. In any case, the ironing must be done by the small laundry. You have the new gas fired laundry steam press which will get you this business if you will make use of it and get your sales force to sell them.

You have small sterilizing equipment, gas fired, for surgical work, dental laboratories and various other establishments. Above all, every chemical establishment must have heat. A large majority must have hot water. If you don't go after this class of business, I am sure it is not going to come to you of its own volition.

In conclusion, in our territory, we were instrumental in having specifications rewritten for a summer air conditioning job in a large department store with a result that a $200,000 contract was signed for summer air conditioning, using the Silica Gel gas method. True, well water is used for cooling but that would also be so if electricity were used. This will give us 7,000 cubic feet per hour connected load of 540 B.t.u. gas with about 1000 hours of use with 60% load factor. In addition, we are trying to install gas fired steam boilers throughout this building for summer use, and to be cross-connected to their steam lines so they can use their own steam plant in the winter. This will give us an additional 2400 cubic foot load. As the result of this summer air conditioning, we expect about 12 million cubic feet of gas to be sold during the off-peak season. This air conditioning load is equivalent to 434 tons of refrigeration and will be doubled next year. So you see, we have the tools, and as the demand increases for more tools, I have no doubt that you will get them from the manufacturers. Continue on and sell, sell, sell!

New Attractive Auditorium Promotes Gas Appliance Sales with Demonstrations and Radio Broadcasts

by Will Simms

MODERN gas appliances and their use are being effectively promoted by the Public Service Co. of Colorado through a new Gas Hospitality house which includes an auditorium, a model kitchen, a model bath, an air conditioning system, a cooking demonstration and a radio broadcast—all designed with the one purpose of increasing the use of gas and gas appliances.

While built by the Public Service Co., the Gas Hospitality House is designed to benefit the dealer as well as the utility, the plumber as well as the gas appliance floor salesman. Its purpose is to bring the dramatic background of gas into the public eye, to dramatize the cleanliness and economy of gas, and thereby sell the public on the use of gas service through modern appliances.

Note the Welcoming Atmosphere of this Attractive Entrance.

The consumer side of the promotion consists of a well regulated program. From 9 a.m. to 1:30 p.m. daily, except Sunday, Gas Hospitality House on the second floor of the Gas & Electric Building, Denver, is open for inspection and individual consultation on gas services and related problems. From 2 p.m. to 3:30 p.m. modern cookery is demonstrated in the model kitchen by Vera Carter Ault, hostess of the new auditorium and the utility's home economist.

A gas promotional story which is changed from time to time features the first part of the demonstration. In this story, Clair G. Henderson, superintendent of gas sales promotion, presents demonstrations by illustrated talks or films designed to create an active *appreciation* of gas service in place of the public's present *passive acceptance.*

He dramatizes the modernity, cleanliness, convenience and economy and dependability of the fuel along with the background of the gas industry. The demonstration now being used was designed to present forcefully the cleanliness and economy of gas as a fuel. It consists of showing the audience by means of a glass gas holder just what 2 cubic feet of gas looks like—emphasizes its cleanliness and purity, since even in a glass holder the gas cannot actually be seen.

Then the holder is connected to a modern range burner on which is placed a pyrex cooking dish containing potatoes and a small amount of water. The audience is asked to estimate the length of time that this 1/5 cent's worth of gas will supply the correct amount of heat for this cooking operation. Observers, as might be expected, are surprised to later see that the 2 cubic feet of gas furishes modern heat for about 50 minutes.

The next part of the program is a radio broadcast directly from the model kitchen. After that local station program Vera Carter Ault gives a demonstration. She features not recipes, but cookery designed to promote the modern gas range and the gas refrigerator. The demonstration is for the purpose of showing the value of gas service when used through modern appliances. The company recognizes the fact that those ranges built for beauty and not modern performance destroy the use of gas in the long run.

After the demonstration the auditorium is again open for inspection and individual consultation from 3:45 to 5 p.m.

As to the dealers' part in Gas Hospitality House, the promotion has a three-point purpose: I. It is to create customer demand for gas appliances. This it does by the program just outlined. 2. It is to act as a clearance house on dealer questions. This it does by being open to dealers at all times for their inspection and to hear their problems and questions. 3. It is to be an educational institution for dealer employes. This it does by holding meetings to instruct employes in selling appliances. It recommends the "tip bonus" for the plumber's journey who sees opportunities for sales and makes the most of them. It instructs the dealer how to merchandise aggressively so that the "smart" dealer can still earn a legitimate profit.

The structure of Gas Hospitality House itself shows every evidence of being constructed with a definite purpose in mind. The auditorium, about 50 by 40 feet, is lined on the ceiling with white gypsum board of grooved designs. The walls are covered with grooved celotex. The color creates the atmosphere of cleanliness of gas; the composition and lines are for radio acoustical value. The floor is two-toned green rubber floor covering, representing modernity and cleanliness and yet is sound proof.

The model kitchen in front of the auditorium is typically modern with blue linoleum floor, white steel kitchen cabinets with orange interior, a window and venetian blinds, white ceiling with stainless steel splasher back over sink and cabinets. It is arranged in the modern style—1. Planning center. 2. receiving and storage center. 3. cleaning center. 4. preparation center.

To conform with the idea of dramatizing gas, the kitchen and auditorium have been constructed and equipped in the manner of a theatre stage with an automatic driven silver curtain across the kitchen, flood lights and spot lights over each gas appliance. On either side of the "stage kitchen" is a gas water heater attractively displayed under gold curtains. The lights are controlled from a master switchboard so that they can be dimmed as in a theatre and any spotlight can be turned on any object at any time.

At the left of the "stage kitchen" is a model bathroom. Its purpose is to promote the business of plumbing dealers through the modern fixtures installed and to dramatize hot water service—the use of another gas appliance.

Another unit set off at the side of the auditorium and in white to denote the cleanliness of gas, is a model air conditioning display in operation, illustrating the use of gas in this field. The Hospitality House is heated, humidified and ventilated with this gas unit.

Facing the "stage kitchen" are comfortable white fabricoid chrome chairs in yellow trim. The seating capacity of 90 is made by telephone reservation in advance. A gas unit on display heats, humidifies and ventilates the Gas Hospitality House.

Other features of the auditorium include a built-in talking and slide film projector at the back of the room, a white piano at the right of the stage for radio broadcasts and a cloak room and powder room for the convenience of guests.

Gas Hospitality House will seat 90 persons for the program. It is outfitted with 90 beautiful white fabricoid chrome chairs in yellow trim. To regulate attendance, the House has had to require reservations for the afternoon program. People may telephone for their reservations, and after 90 have been made further call-

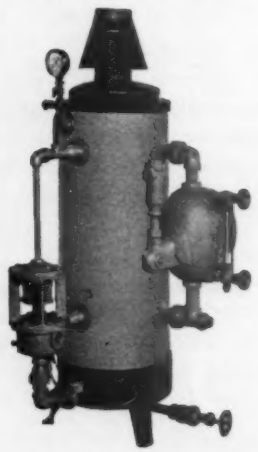
ers are invited to attend the next day or some other date. This is to facilitate broadcasting and also prevent ill will that might arise if the meeting were open and some people would have to be barred because of lack of space. Each person attending is presented with a very attractive souvenir booklet containing her name, a pencil, a chart of canned goods and quantity serving measurements, baking chart, blank pages for memoranda and a few advertising pages on gas appliances.

The whole idea was worked out by G. B. Buck, general commercial manager of the company, who although being closely connected with electric promotion, recognized that gas had to be dramatized and presented as the modern form of heat if sales were to grow in that industry. And his idea promises to revolutionize the gas and gas appliance business in Colorado.

New Butane Plant at Ozark, Ala.

Construction of Ozark's modern butane gas plant has been started. Pipe lines are being laid in the streets, and gas will be made available to every house in the city. This plant is a PWA project, the Public Works Administration donating $22,000 to the cause, and the City of Ozark floating revenue bonds in the amount of $27,000, making the total cost of the plant $49,000.

INDUSTRIAL GAS BOILERS
Tubular or Flueless
¾ to 45 H.P.



P. M. LATTNER MFG. COMPANY
CEDAR RAPIDS, IOWA

Home Service and Dealer Cooperation

Gladys B. Price
Southern California Gas Company

DEALER cooperation and dealer merchandising are probably one of the most debated problems within the gas industry and before discussing the place of home service in dealer cooperation I believe we should reach some common ground of understanding as to the dealer's place in the utility situation. In attempting such a thing, I feel very much of the same opinion as the colored lady who, after a visit to her doctor, announced that he had said she was the victim of acute indiscretion.

I'm quite sure we all agree that the gas industry must look to its dealers to do the major portion of the selling job which must be done in the next few years. As an industry we are now taking a constructive viewpoint toward dealer merchandising. We realize that we should further dealer relations because it's good business. The dealer, the manufacturer and the utility should be directing all their efforts towards unity in the promotion of gas to the mutual advantage of all. Fundamentally the dealer is in business to make money. He is either a good, poor or indifferent merchandiser and he doesn't care particularly what he sells so long as it is profitable. As profits decrease, loyalty to a product diminishes with alarming rapidity. For this reason then it must always be profitable for dealers to merchandise gas appliances. Lately, surprising applications of this have come to our attention. We have seen old established gas appliance dealers stock their floors with elaborate displays of electric equipment preparatory to the windfall which they have been promised when Boulder Dam power is available. In other words, the picture was painted greener on the other side and while the dealer hasn't fallen for it completely, he is now willing to gamble. In the face of this situation it would seem logical that utilities should stimulate gas promotion to the extent of finding all possible ways and means of making gas appliance merchandising attractive.

Since this paper is on "Home Service and Dealer Cooperation," I'd like particularly to stress the word "cooperation" and give you a hillbilly's definition. He says there are three kinds of cooperation:—first, there's the guy that was a born hitchhiker. He just thumbs his way through life never doin' nuthin' hisself. He waits until he finds someone goin' his way, then loads hisself onto them and lets them carry him along. Second, there's the guy what talks big but don't ever do nuthin'. He's always getting on committees which he don't do nuthin' to help and promisin' to attend meetin's which he don't show up at. He's the guy that gives lip-service cooperation. Third, there's the real cooperator, the fellow what can be depended on to do jobs he promises to do. He's the guy what makes clubs successful, what makes industries grow and what makes the world go 'round. He's the fellow you're glad to know and the fellow you calls reliable. I believe this describes the prevailing types of dealers and I'm not prepared to offer any suggestions for the first two. As for the third type, I believe the gas industry should adopt at least one in every community, convince him of the desirability of gas promotion and go all the way. In such a situation Home Service can do its share towards increasing gas load.

Dealers' Attitude Improves

It is obvious that the majority of dealers cannot afford to support their own home service department. Therefore, the fact that the utility maintains a department which is available to each and all of them immediately establishes a bond of interest. During the last three years we have watched a definite change in the attitude of dealers towards utility home service. At first they were

A paper read before the 43rd convention of the Pacific Coast Gas Assn.

sure that it was simply a means of robbing them of their prospects or gumming up their sales after they had been made. Today we are literally swamped with requests for home calls, adjusting complaints, dealer demonstration and a dozen other possible services. In fact, one of the dealers' sales points is that a home service representative will call and explain the most efficient use of the appliance and leave recipes. This gesture establishes the dealer as having a certified connection with the gas company and the purchaser feels assured that she is buying standard approved merchandise.

Handling Complaints

The handling of dealer complaints is now a regular duty of home service. Needless to say, this type of work successfully done requires a woman with qualifications that should get her a job as a foreign diplomat to a warring nation. Nevertheless, Southern California Gas Company's home service department has adjusted 81 complaints for dealers since January 1 of this year. Our plan is, first: to consider that the customer is right until we prove to her satisfaction that she is wrong; second, to cause the dealer as little annoyance as possible, preferring to work through the manufacturer or the gas company service department; third, to ultimately make sure that the customer is definitely satisfied. We have never had any grief over prospects, in connection with home service calls on dealer sales, but I believe that it is a definite problem that should be settled before it arises. In other words, prospects arising from dealer home calls belong to the dealer.

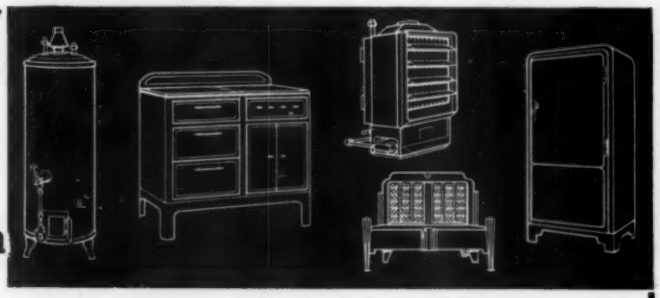
I have covered the initial method of establishing home service cooperation. There isn't any dealer who can't see the sales value of a satisfied customer or the cash value of an adjusted complaint. These two activities, if successfully done, are the wedge by which the utility may approach the dealer for further promotional or educational cooperation. While home calls and complaint calls should be done for all dealers, I believe that promotional work should be reserved for the dealers who really know the meaning of the word cooperation, not the ones who are thumbing their way as merchandisers. No matter how good a home service representative may be, she can't be a publicity agent, a property man, a salesman and a contract writer. Somebody has to do something besides accept the commission check. So in the remaining part of my talk on any proposed promotional work I'm assuming that it's to be done with dealers who are willing to work and make the most of the opportunity offered by home service.

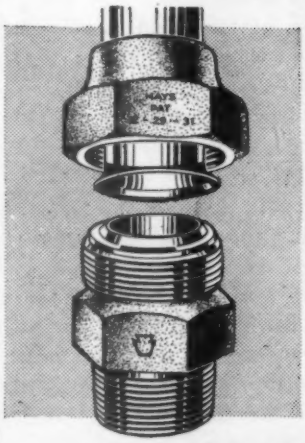
Cooking Schools

Our most successful dealer promotional activity has been newspaper cooking schools. It has taken three years to build this program into something the dealers actually request. The school which was put on in San Bernardino last spring, appears to our company to represent a practical kind of dealer cooperation. There were thirteen dealers in this school who built a beautiful exhibit in the lobby of the theatre. They contributed several hundred inches of gas appliance advertising which resulted in an unprecedented attendance and interest. I am also reminded of an instance when the newspaper did not cooperate. The dealers then took it upon themselves to promote the school and furnish prizes. The school was highly successful and the dealers were particularly pleased, not only with the school but with themselves. Let me remind you again that these are the results of three years of cooperative work with dealers through dealer representatives and home service.

Dealer demonstrations, and by this I mean a miniature cooking school using range and Electrolux, the audience being secured by invitation, in the dealer's store are highly successful, the degree determined by the amount of effort and money which the dealer is willing to spend. In the case of small dealers who do not understand utilizing this type of promotion and who are not willing to arrange the necessary build-up and fol-

Hook Them Up This Modern Way





Use Double Seals for Economy and Tighter Connections

Copper pipe is neat and flexible—Hays Double Seals make strong gas tight connections. Together they make a modern team worthy of the finest gas appliances. Note how the 2-faced pipe flare (45° + 90°) makes up on the 2-faced machined seat of the fitting. It's copper to copper with no sealing agent required.

Write for catalog.

400 STYLES & SIZES

HAYS MFG. CO. ERIE, PENNA.

Specify HAYS DOUBLE SEALS

low-through, it is useless to waste the time of home service. However, in these smaller groups the home economist can concentrate on sales features. She is closer to her audience and they feel free to ask questions and discuss appliances. This type of promotion is most effective where there is not a general public acceptance. The electric industry is concentrating on this type of dealer cooperation at the present time, knowing that with increased public acceptance sales become easier and one by one their converts carry their story. Since natural gas in Southern California has always had public acceptance, the dealers feel that the one by one method is pretty slow compared to a high-pressure campaign. This is illustrated by a remark made by a gas salesman of Seattle to the effect that in Southern California more ranges were sold by accident than it was possible to sell on purpose in the Northwest.

Show the Dealer What Gas Appliances Will Do

Since we have admitted that the gas appliance dealers must, with the utility's help, do a big selling job, why not teach their salesmen something about the appliances we'd like them to sell? After all, it's the salesman who gets the name on the dotted line and he usually sells the appliance that he himself is sold on or at least that he knows the most about. Since many dealers carry electric ranges and the electric companies are engaged in an extensive educational campaign, I believe you can draw your own picture. Women are the ultimate purchasers of gas appliances and they don't care a hang whether a man can stand on the oven door without breaking it, or whether the range has a steel frame. She wants to know what it's got that her old range doesn't have, what it will do to lighten the drudgery of three meals a day and can it cook spinach so Johnnie will eat it? How many salesmen know about oven meals, waterless cooking, thrift cookers, broiling, meat roasting, and one-dish meals? Dealer education on what gas appliances will do for the housewife is, in my opinion, the biggest job home service could do for the dealer and the gas company. It should be accomplished through discussions and actual demonstrations.

Proof of a Profitable Policy

Believe it or not, but cooking methods have changed materially in the last few years, and as Wrigley says, we should tell them fast and tell them often of the many miracles of modern automatic gas cookery and refrigeration. Manufacturers have recently sensed the need for better trained salesmen and at least two national gas range manufacturers are attempting to give actual demonstrations to their dealer salesmen. The fact that they are still at it after several years must prove that sales actually did increase. The gas company is not, however, interested in promoting one make of range over another but in the general acceptance of gas as the best and most economical fuel. Kitchen planning, recipe service, bulletin service, help in designing sales floor kitchens, window displays, sales floor demonstrations—all these things can be done for the dealer who will take advantage of them.

Entire Organization Should Give Full Support

Before any of the foregoing ideas can be put into effect the personnel of the gas industry must be fully in accord with the idea of dealer cooperation and lend their enthusiastic support to such a program. Home service is helpless in the face of supervisory antagonism.

May I say that home service has already proven its worth to dealer programs in many utilities and stands ready to develop new ways of helping the dealer to help himself and the gas industry.

In summing up the relationship between utility and dealer I am reminded of the story of the wolf who boasted of his ability as a runner and in order to challenge him a race was staged between the wolf and a rabbit. Contrary to expectations the wolf lost the race and was pressed for an explanation. His answer was that he was only running for his dinner, while the rabbit was running for its life.

American Home Economics Association

The annual convention of the American Home Economics Association was held in Seattle, Washington July 6-9, 1936. The attendance of 1500 consisted largely of such leaders and executives as: (1) Heads of Home Economics Departments in colleges and high schools; (2) State and city Home Economic Supervisors and Teachers; (3) State leaders of home demonstration work and their county agents; (4) Institution executives; (5) Homemakers; (6) Social workers; (7) Research workers; (8) Home Service Directors of utility companies; (9) Directors of home economics of business organizations; (10) Representatives of the Bureau of Home Economics, Washington, D. C.

In the exhibit of the convention, the American Gas Association, cooperating with the Pacific Coast Gas Association, presented an attractive exhibit.

Among the program subjects of interest to home service directors in attendance were: Standardization of Consumers' Goods; Housing Requirements; Status of Grade Labeling and Honesty in Advertising; Home Economics and National Interests; Consumer Interest in Current Economic Trends by Paul Nystrom; Recent Research in Nutrition and Foods; Trends in Commercial Food Service; and all meetings of the section of "The House" in which equipment studies were particularly emphasized.

The Home Economists of the gas industry attending the convention were the following Home Service Directors: Mrs. Beatrice Strega, Seattle Gas Company, Seattle, Wash.; Jean E. Mutch, British Columbia Electric Railway Co., Ltd., Vancouver, B. C.; Gladys B. Price, Southern California Gas Company, Los Angeles, Calif., Katherine L. Rathbone, Southern Counties Gas Co., Santa Monica, Calif., Ruth Kruger, Central Arizona Light & Power Company, Phoenix, Arizona; Elizabeth Reger, Portland Gas & Coke Company, Portland, Oregon; Frances Peterson, Washington Gas & Electric Company, Tacoma, Wash.; Marion A. McKinney, Central Illinois Public Service Co., Mattoon, Ill.; Betty Boyle, The Gas Service Company, Kansas City, Missouri; Dorothy Shank, American Stove Company, Cleveland, Ohio; Jessie McQueen, American Gas Association, New York, N. Y.

Maryland Utilities Assn. Meeting Sept. 12th

The mid-year meeting of The Maryland Utilities Association will be held on September 12th at the George Washington Hotel, Ocean City, Maryland. At 9:30 A.M. separate meetings will be held for the gas, electric and transportation groups, each of which will be addressed by a speaker on pertinent subjects. The afternoon will be available for social and recreational activities, and in the evening the three groups will meet together for a banquet and a general meeting. At this evening meeting an address will be made by a speaker on a subject of interest to all in attendance; following the evening meeting a dance will be held.

Forty-Third Annual Convention of the Pacific Coast Gas Association

Grady Photo

JAMES F. POLLARD
President, Pacific Coast Gas Association

LIKE a sentinel set on high, towering above San Francisco stands the Hotel Fairmont, massive, majestic, commanding, with a wonderful view of the new $77,000,000 San Francisco-Oakland Bay Bridge—the $35,000,000 Golden Gate Bridge and the $40,000,000 Golden Gate International Exposition now under construction. What an ideal setting for the 43rd Annual Convention of the Pacific Coast Gas Association just concluded. With some 600 leaders representing Gas Companies and Manufacturers from all parts of California, Nevada, Arizona, New Mexico, Oregon and Washington the 1936 Convention made a new record for attendance, as well as enthusiasm, according to Henry Bostwick, General Chairman. The slogan "GAS MARCHES ON," was carried throughout the entire program, stressing plans for advancement in production, method and service to meet the needs of an increasingly discriminating public.

James F. Pollard, president of the Seattle Gas Company was elected President succeeding Mr. H. M. Crawford, general sales manager of Pacific Gas and Electric Company, Norman R. McKee of Southern Counties Gas Co. was named vice president and D. G. Martin was re-elected treasurer.

In his welcoming address, James B. Black, president Pacific Gas & Electric Co., stated that gas is today more essential to industry than it was when electricity first appeared on the industrial scene. He predicted the readjustment of gas to changing economic conditions and the survival of the industry in spite of competition from many directions.

Mr. H. M. Crawford reviewed the progress made by the gas industry through the past year, and ascribed much of the improvement noted to the advertising program carried on during the past year.

James Pollard, in his first official address, likewise stressed the need of advertising. It was he who originated the national advertising campaign now under way. Claude C. Brown, chief engineer of the California Railroad Commission delivered an address upon Utility Regulation in California.

"That Natural gas has no poisonous actions on the human system" was the startling declaration made by Dr. D. R. Drury, Professor of Physiology of the University of Southern California. Dr. Drury told of experiments made on both human and animal subjects, involving long continued exposure to the gas. Dr. Drury said in part:—

"Four subjects, two students and two gas company employees were exposed for two hours to a concentrate of 25% gas in air. A thorough physiological examination was carried out on them before, during and after the exposure. Subjectively the men experienced no symptoms except the smell of the gas and a sense of mild exhilaration. No after effects were experienced. No disturbances of appetite or eating. Vision was tested by the standard methods and no change at all was found.

"We tested the mental processes with sums in addition. No change in the time taken to do the addition, nor a tendency to make mistakes was noted. Body temperature and respiration were not affected by the exposure. Other tests showed heart, kidney, liver, etc., unaffected.

"In conclusion we see from these results that natural gas, even in concentration of 25% and 30% has no demonstrable effect on the vision or the body. We have studied the effect of concentrates of 60% and 80% and these very high concentrations have some anesthetic action."

Claude Brown, chief engineer of the California Railroad Commission, praised the high standard of service rendered by California Companies, and stated that rate reductions in the past 25 years amounted to more than $800,000,000 on a cumulative basis and urged utility men to call on the state regulatory body for aid in working out utility problems.

Ralph Edwards, general counsel of Southern Counties Gas Company complained of present California methods of taxing properties under which the State board of equalization makes the assessment on utility holdings. "The State body assesses utility real estate on a basis of capi-

talization of earnings with stock and bond holdings added, whereas county assessments are based on actual values. The result is a higher tax base on utility property than on adjoining real estate," he said and urged the adoption of one of the two methods so that a uniform assessment basis could be operated for both classes of real estate.

An interesting feature of the Convention was "The Gas Attack" A Daily send-out of Burps and Blurps published for no reason at all. The Staff included CHIEF GASSER . . . Al C. Joy, advertising manager, Pacific Gas and Electric Company and five other GASSERS. This publication was established as a contribution to the frivolity and fun-making of the convention. Irrevelancy was the keynote of its character, jesting was its prescribed method of expression, and the raspberry its favorite fruit. But it reserved the right to step out of character at any time and greet its readers with a note of seriousness. Quoting a few serious sentences:

"We hope this convention will remain always in illuminated memory with all those attending it because of the enjoyment it offers. But we hope too that it will send every delegate home enriched in knowledge and understanding of this great industry and its aims and hopes."

A taste of California's Hospitality was enjoyed by the visitors with Mr. C. B. Babcock, as Chairman of the Entertainment Committee and Mrs. H. M. Crawford as Hostess. In addition to the numerous luncheons and annual banquet and ball the visitors were taken on a Boat

CLIFFORD JOHNSTONE
Managing Director, Pacific Coast Gas Association

Trip on San Francisco Bay to inspect the Eighth Wonder of the World, the $77,000,000 San Francisco Oakland Bay Bridge (almost completed) the $35,000,000 Golden Gate Bridge and the $40,000,000 Golden Gate International Exposition now rising on a 430 acre island being dredged up in the middle of the bay by a fleet of United States Army dredgers.

A detailed description of these mighty projects was given by Mr. Bernard of the Golden Gate Bridge, Miss Julie Goss of the San Francisco Oakland Bay Bridge and Ted Reindollar of the Golden Gate Exposition. Officials have received many requests for space from Manufacturers of Gas Appliances and from Public Utilities.

Manufacturers Section

The Manufacturers Section of the Association held its meeting August 26th. The following officers of the various divisions were elected:

General Chairman, W. J. Bailey, Day and Night Water Heater Company; Vice-Chairman, C. R. Graham, Jas. Graham Mfg. Company.

Furnace Division: Chairman, R. G. Logue, Ward Heater Company; Vice-Chairman, W. W. Norton, Electrogas Furnace & Mfg. Co.

Range Division: Chairman, W. C. Gaffers, Gaffers & Sattler; Vice-Chairman, Geo. Hammer, Hammer-Bray Company.

Water Heater Division: Chairman, R. C. Hoyt, Hoyt Heater Co. of No. Calif.; Vice-Chairman, W. R. Smith, Continental Water Heater Co.

Space Heater Division: Chairman, A. J. Hartfield, Pacific Gas Radiator Company; Vice-Chairman, J. S. Andrews, Andrews Heater Co.

Serves Both Sides of International Border

THE St. Croix Gas Company is believed to be the only gas entity serving both sides of the international boundary. From its plant in Calais, Me., just over the U. S. end of the international bridge which connects the U. S. and Canada, and the city of Calais, Me., with the town of St. Stephen, N. B., on opposite shores of the St. Croix River, this river is the dividing line between the republic and dominion for about 60 miles, westward from the Atlantic.

At each end of the international bridge, this gas firm maintains a combination show and demonstration room and office for payment of gas bills. The two locations are only 75 yards apart, although in two different countries.

The gas is piped under the bridge from the Calais plant to St. Stephen.

A standing challenge is available at both ends of the international bridge to anybody who can prove there is any other fuel which can equal gas in low cost and promptness of heating and cooking. It is announced that $100 in cash awaits the person who can prove his or her contention that such a fuel exists, the demonstration to take place in either of the two gas showrooms, according to which side of the river and border, the disputant comes from.

An aggressive sales policy prevails on both sides of the boundary, not only in behalf of gas consumption, but in sales promotions for fixtures and appliances. At each of the two showrooms, typical reading rooms, equipped with the latest in gas reading lamps, have been on display, each provided with a supply of magazines, books and newspapers. People from each side of the river are invited in either of the stores to test the claim of the company that the new gas reading lamps are as effective as claimed.

A Complete Program for Dec. Sales Promotion

By

Fred E. Kunkel

THE Christmas holiday season is one period of the year when the average gas appliance merchandiser need not resort to high pressure methods to move his merchandise, if he presents his stock in an *arresting* and attractive manner, stages good selling windows, and prepares sales producing direct mail and newspaper advertising to get his share of the Xmas business.

The effort and expense involved in securing this extra business will be more than justified when considered in relation to the prospect the Christmas season holds out of adding something worthwhile to the sum total of the year's business. Why not consider any or all of the following ways of increasing Christmas sales:

1—Prepare gift suggestion lists;
2—Issue illustrated booklets or circulars;
3—Feature gift certificates;
4—Offer to cash Christmas savings checks;
5—Send out direct mail letters or postcards;
6—Use individual or cooperative newspaper advertising;
7—Plan specially attractive and unusual window displays;
8—Feature lay-away sales and early buying;
9—Use attractive display signs on delivery trucks, such as "On Our Way With Another Christmas Present From—" or "Delivering More Christmas Presents From—"
10—Feature mail and telephone orders in your advertising;
11—Use attractive inserts for November statements;
12—Use gift tables or create a Gift Bazaar;
13—Use Last Minute Xmas suggestions;
14—Work up a series of good merchandising stunts;
15—Sell your store as the logical place to buy Xmas gifts;
16—Feature sidelines not carried at any other season of the year.

This suggests broadly the lines of procedure which can be followed to put over a Christmas sales promotion campaign. Then follow through with the determination to make this the biggest, best, and most prosperous Christmas season ever for your store—and you will not be disappointed with results.

The Plan

The gas appliance merchandiser must necessarily have a plan, and if he expects to secure extra business during the Christmas season, he must, first of all, begin to lay his plans early. He should not wait until the rush is on, or about to begin. He should sit down and draft a plan of procedure, thus:

Schedule for Christmas Sales Promotion

Method	Date	Estimated Cost
Newspaper Advertising ..	Nov.—	$
Window Displays	Nov.—	$
Store Displays	Etc.	Etc.
Direct Mail		
Radio		
Telephone Solicitations ..		
Suggestive Selling		
Inserts for November Statements		
Display Signs and Cards		
Sales Meetings		
Training Extra Sales Help		
Checking the Mailing List		

A live mailing list is valuable—a dead one deadly. Mailing lists, no matter how good, must be constantly watched and kept up to date. Before sending out your Christmas literature, check up on the correct addresses, eliminate dead timber. Remember your mailing list must be up-to-date or you will waste a lot of advertising dollars.

Use good sales letters, or postcards, festooned with the trimmings of the season in holly and evergreen, and prepare attractive sales messages for release once a week, each featuring a number of gift suggestions, but not more than twelve. Too many are confusing, so limit your selections to the best, most attractive.

It is well to remember that postcards are inexpensive to mail and they help to bring shoppers in, just as much as letters do. Besides they have the convenience of being slipped into a man's pocket or a woman's purse. By sending out postals or letters once a week regularly, you can bring more shoppers in, since the message is both direct and personal.

Don't wait for the parade to start in your direction. Take your gifts to the people. Keep them from going elsewhere by a good salesmail campaign, and tie it up with your newspaper advertising, if any. A well planned sales promotion campaign is one way to start things going and to keep them coming.

For instance, you can plan a series of mailing pieces, booklets, circulars, letters, postcards, and send them out every week or ten days apart until Christmas time. Nor need such a series be expensive. Each release should carry an interesting selling story of half a dozen of the most attractive gift items you can think of, and these should be played up in a strong inducive way.

Above all, make your printed matter easy to read. Show pictures of your gift items in their most fetching pose. Suggest gifts as purchases in a most irresistible manner. But don't try to get all of your merchandise into a single mailing piece. Save some for next time and send out another circular. In general, it is well to follow a certain line of sales propaganda, such as:

1—Introductory talks about your store as the logical place to buy practical and useful Christmas gifts;
2—Stress the importance of early shopping, leisurely selections;
3—Offer to furnish gift certificates and send them samples of what they look like;

4—Use pictures and prices in all your advertising and plenty of illustrations, enticingly presented, with short descriptions;

5—Feature a courtesy day or have a special sale or have bargain tables.

Newspaper and Radio Advertising

Start your newspaper, direct mail or radio advertising campaign early. Let your copy headings be attractive enough to compel a reading. Use plenty of illustrations to liven up your copy, with such headlines as, "Ah, Just The Thing For Mother (Dad, Aunt Sue, Uncle Jim, etc.)." "Hints For The Hurried," "Thoughtful Giving," "Timely Suggestions For Busy Xmas Shoppers," "The Gift To Give," "Easy to Choose," "Gifts For Every Woman's (Man's, etc.) Christmas."

Feature early Xmas shopping in all of your advertising, and tell them this is the logical time to make selections—

> "Why not scratch a few names from your gift list by making selections from this page. Prices are reasonable, collections complete. You will enjoy choosing them while assortments are at their fullest. Many gifts are inexpensive, too."

Make from one to six concrete gift suggestions in each corner of your ad, letter or postcard, each gift item attractively illustrated to promote desire to own it, but doing it in such a way that six or more concrete gift suggestions are thrown out on each advertising page, letter, postcard, circular, etc. Select your most attractive gift items. Run an alphabet of gift suggestions, or run them in 1-2-3 fashion with a punch that will pull business. In general follow a plan, e.g.:

1—Make it easy to select useful gifts, especially those intimate gifts for anyone in the family;

2—Feature the fact that the name of your business on any article is the hall mark of quality, and assurance that such a gift will be received with appreciation;

3—Display foremost such gifts as are truly expressive of the Christmas spirit—relegating other items to a background position;

4—Have sales people demonstrate that the merchandise is well made and of fine quality;

5—Have a few gifts on each display appropriately and attractively boxed;

6—Encourage your customers to shop early to avoid all the worry, hustle and bother that the late shopper always experiences;

7—Point out that the early shopper has the leisure and opportunity for careful selection;

8—Create displays which suggest at sight, so that people will not have to chew on pens or wrinkle their brains about what to give.

Featuring Bargains to Bring Them In

In spite of propaganda to shop early and mail early for better service, Old Man Procrastination usually takes his toll and holds back hosts of shoppers with one sweep of his mighty arm, and that is why it is a good plan right after Thanksgiving to feature bargains to get them in, not only for those items, but with the hope that when they do come in they will also buy something else—and they frequently do.

In other words, to get the Christmas shopping spirit moving on the run and to boom buying for the early part of the Christmas season, offer a few attractive items at bargain prices to lure in bargain hunters seeking bargain prices to cut down an otherwise overcrowded Xmas budget, with the certain knowledge that after they buy the bargain, they will look around the store, see other attractive items and so make purchases in advance of the rush, or spot items which they like and for which they come back later.

Gifts, the Theme

Items may be arranged according to "Suggested Gifts For Students," "Gifts For Women (Men)," "Unique Gifts For Everyone," "Special Xmas Gifts," "Gift Novelties," etc. Then as Christmas approaches and the last minute rush begins, come such headings as "Easy to Choose," "Service Right Up To The End," "Helpful Hints," etc., so that people can rush in at the last moment and find exactly what will suit them to settle the vexing gift question to their complete satisfaction.

For this period pick the items which have proven the best sellers and group them as such, and also items which are easy to select and advertise as "Last Minute Gift Suggestions Which Are Sure to Please."

Eleven Activities for Success

Thus your merchandising campaign will be well rounded out and nothing left to chance or speculation. In conclusion:

1—Dress up your store; have special decorations that give it a most attractive holiday atmosphere, the kind that is talked about.

2—Re-arrange your stock generally and liven up displays. Let it be known at a glance that you are out after the Christmas business in earnest—also that you have a lot of new and worthwhile things;

3—Do special advertising—lots of it—and see that everyone in the store is thoroughly familiar with the advertising. Keep a framed copy in your window and in the store, where both salesmen and customers can refer to it;

4—Go over your stock carefully. Make complete gift lists, such as: "Gifts For Mother (Dad, Sister, and so on down the line)." List every possible item under every heading and have your salesmen study them so that no bets will be overlooked when they are called on for suggestions;

5—Make a special drive to bring old customers back during the holidays. Use direct mail. Give them a real reason to come and follow through on the idea;

6—Change your window displays at least twice as often as you ordinarily do;

7—Make special showings of gas appliances, with emphasis on the utilitarian pieces;

8—Study this magazine—see what others are selling and how;

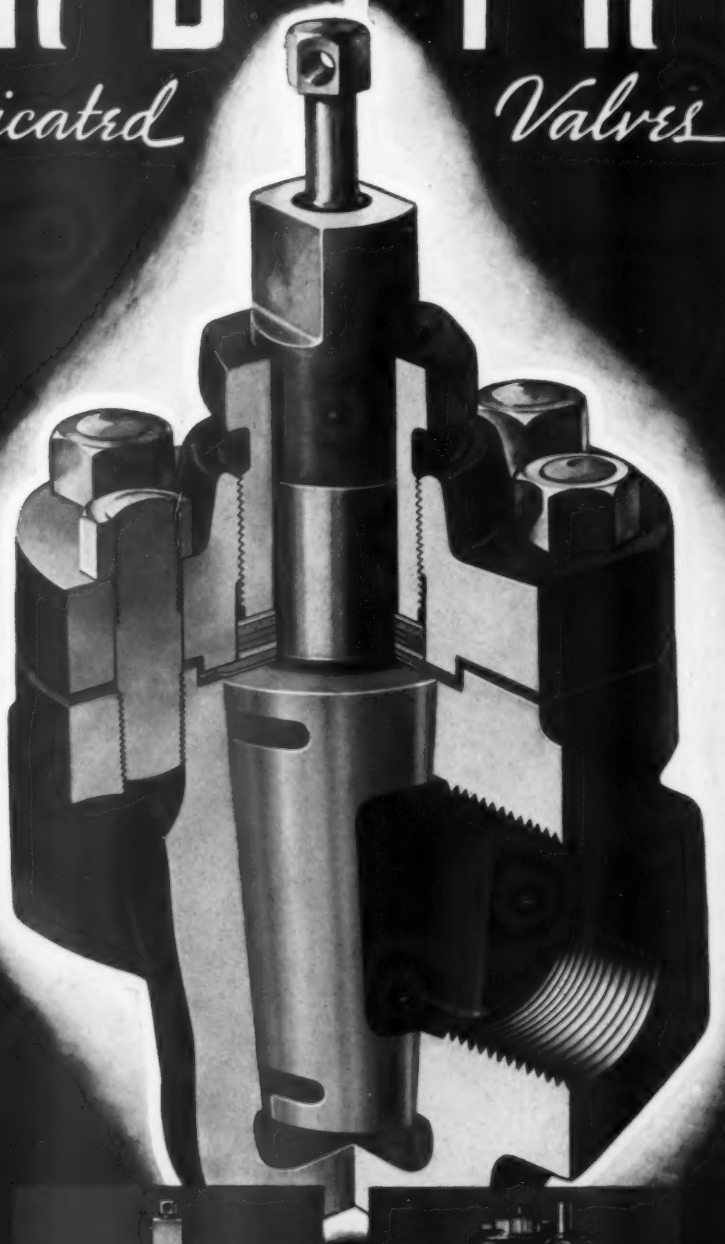
9—Work your mailing list overtime with well-designed direct mail and personalized letters;

10—Have a special gift wrapping service and advertise it. Make every package that goes out as attractive as you know how to make it;

11—Be sure your stocks are sufficiently large to encourage people to buy.

NORDSTROM

Lubricated Valves



EMCO-NORDSTROM TYPE

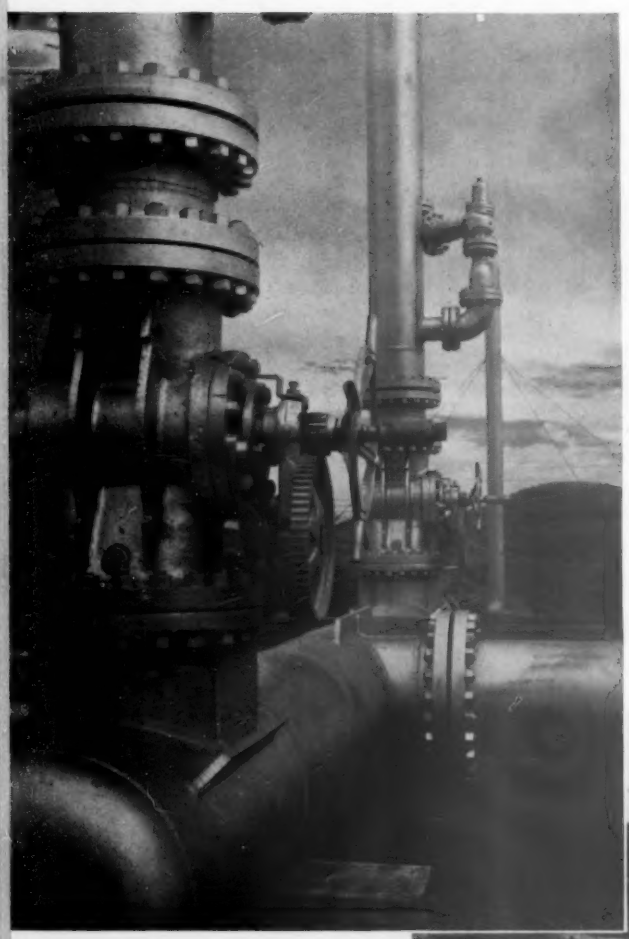
Round Opening
HYPRESEAL TYPE

STANDARD TYPE

THE ENGINEERED VALVES FOR EVERY NEED. FREE-TURNING. LEAK-RESISTANT. CORROSION-RESISTANT. FOR WIDEST RANGE OF PRESSURES AND TEMPERATURES

HYPRESEAL TYPE

PERFECT APPLICATION OF A PRINCIPLE

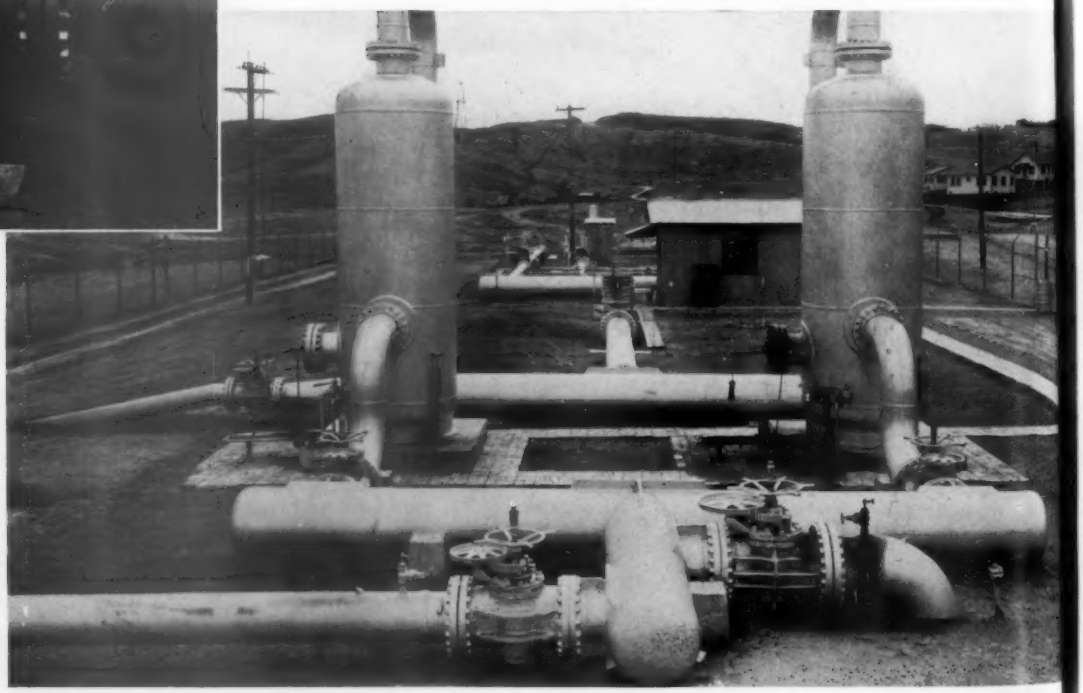


A GAS TRAP ISN'T MODERN UNLESS NORDSTROM-EQUIPPED

Intermittent pressures, corrosive elements, suspended dust and other elements encountered in gas trap lines are best controlled by Nordstrom Lubricated Valves. Regardless of line contents, these valves will shut tight, keep sealed, and are easily opened by a quarter-turn.

FOR PIPE LINE SERVICE

Practically all gas transmission, crude and gasoline lines laid during the past five years are equipped, in part at least, with Nordstrom Valves. For high-pressure service, Nordstroms are practically a necessity.



ONLY NORDSTROMS MEET EVERY MAJOR VALVE NEED

There's a type for each service. Sizes from ½" to 30". Choice of metals—cast iron, Nordco steel and special alloys.

Ask for Bulletin

MERCO NORDSTROM VALVE CO.
a subsidiary of
PITTSBURGH EQUITABLE METER CO.

Main Offices: Pittsburgh, Penna. Branch Offices: New York City, Buffalo, Philadelphia, Columbia, Memphis, Atlanta, Chicago, Kansas City, Tulsa, Houston, Los Angeles and Oakland.

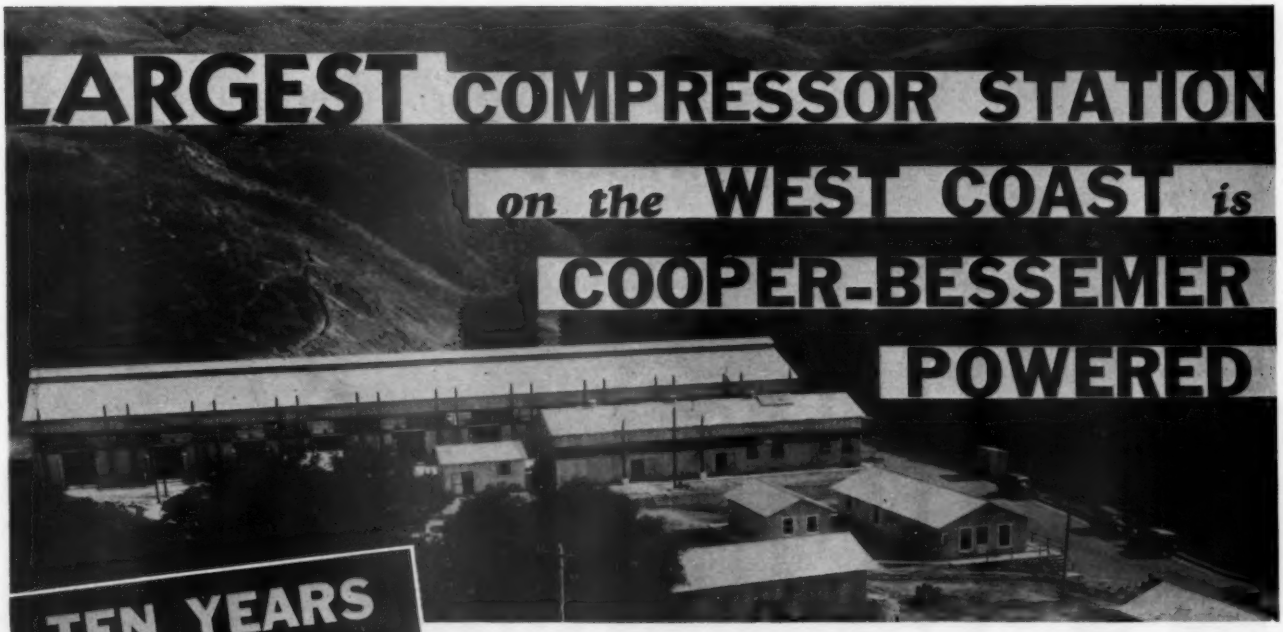
NORDSTROM VALVES

LUBRICATED PLUG

"SEALOPORT" LUBRICATION

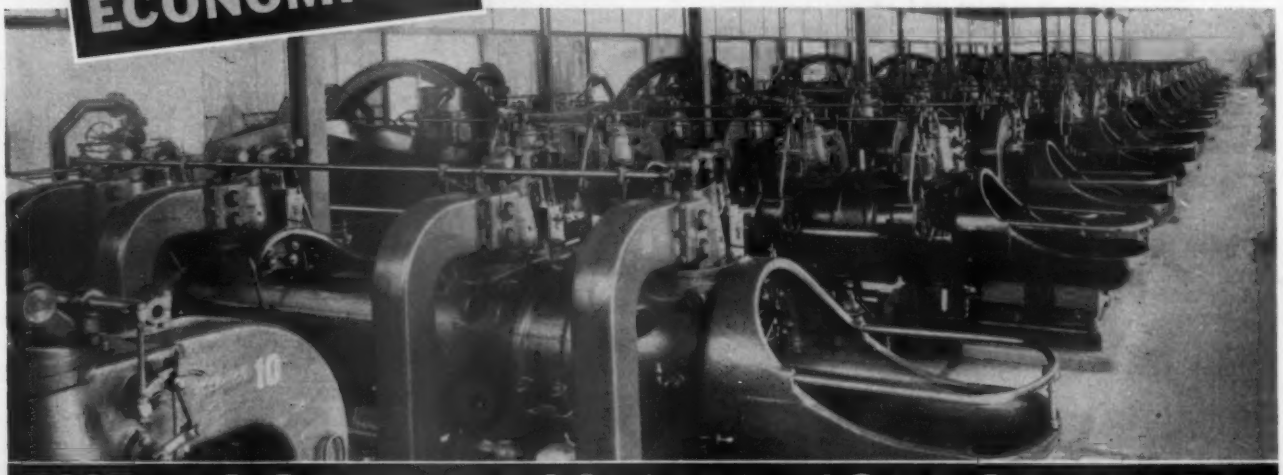
PATENTED

LARGEST COMPRESSOR STATION *on the* WEST COAST *is* COOPER-BESSEMER POWERED



TEN YEARS *of* CONSTANT OPERATION *Prove* "TYPE 19's" *Most* RELIABLE *and* ECONOMICAL

It is no surprise to the Ventura Fuel Company that these ten twin-tandem compressor units have behaved so well and have cost so little to operate and maintain. The reliability and low operating costs of Type 19's are well known on the Pacific Coast—where most of the compressor units in the entire natural-gas industry are Cooper-Bessemers. ● For ten years, these compressor units have been sending natural gas to the Los Angeles district. And they are still good for many more years of economical operation. These 760-H. P. Units are almost exact duplicates of the 1000-H. P. Cooper-Bessemer units, except that they are built smaller to make them easier and cheaper to haul and erect.



THE COOPER-BESSEMER CORPORATION

640 East 61st Street . . . Los Angeles, California

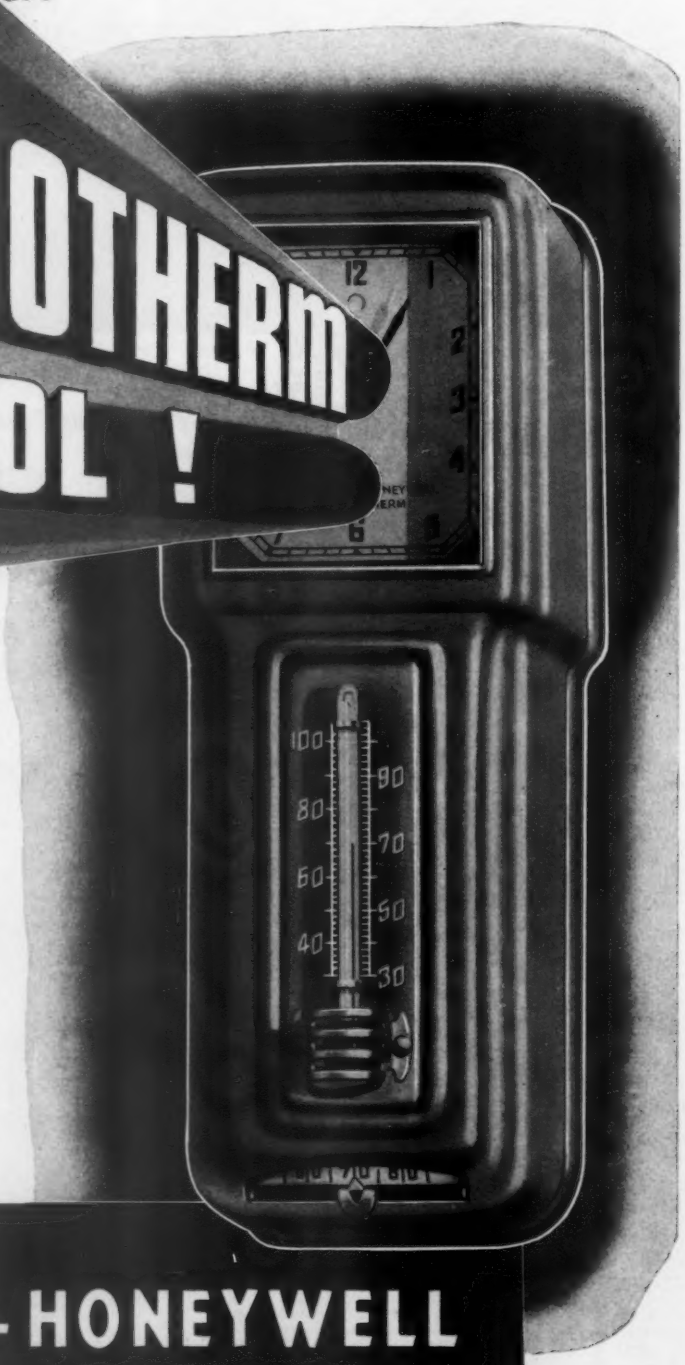
25 West 43rd St. New York City — Mills Bldg. Washington, D. C. — 631 Spring St. Shreveport La. — 201 East First St. Tulsa, Oklahoma — Magnolia Bldg. Dallas, Texas — Esperson Bldg. Houston, Texas — L. W. Rogers, 6 Finsbury Square, London E. C. 2

Mount Vernon, Ohio — PLANTS — Grove City, Pennsylvania

LEVELED HEAT AND FUEL ECONOMY

With

CHRONOTHERM CONTROL !



CHRONOTHERM Control not only gives your customers leveled heat, but in addition provides fuel economy through automatically lowered night temperature. Savings of 10 to 30 percent are common with Chronotherm Control because each degree that temperature is lowered reduces fuel consumption 3.2 percent. Chronotherm Control is simple, fool-proof and entirely automatic. Equip your burners with Chronotherm and provide your customers with the greatest satisfaction from automatic heat. Once you have explained its advantages, you'll find your customers will demand Chronotherm Control for their burners. Minneapolis-Honeywell Regulator Company, 408 East Twenty-eighth Street, Minneapolis, Minnesota. Branch and distributing offices in all principal cities.

■

Dependable Controls Cost Less Than Service

MINNEAPOLIS-HONEYWELL

Control Systems

BROWN INDUSTRIAL INSTRUMENTS FOR INDICATING RECORDING AND CONTROLLING

Peoples Gas Heating and Air Conditioning Show a Success

WIDESPREAD interest in home comforts" on the part of Chicago gas customers was manifested in the attention of 50,000 visitors during the first two weeks of August of The Peoples Gas and Coke Com-Company's "Open House" and Heating and Air-Conditioning Show, which was opened to the public during the month of August, on the Main Floor and Home Service Auditorium of the Peoples Gas Building.

The all-gas model kitchen, known as "America's Finest" at the Peoples Gas heating and air conditioning show, features bright colors and convenience as well as the modern gas range and refrigerator. Utensil closets and appliances are placed conveniently near the work space in a compact, modern setting.

The Company's Home Service Auditorium was divided into sections, featuring exhibits by nine leading manufacturers of heating and air conditioning equipment, each showing the latest developments in automatic devices to provide this phase of home comfort.

The auditorium was newly air conditioned expressly for the opening of the exhibits, and visitors were afforded the doubly convincing experience of seeing the latest developments in a fast growing industry, while at the same time breathing the cool, clean stream of "mountain air" that the units they viewed were capable of producing.

Engineers for the Company, on duty at the exhibit, emphasized the importance of each of the four vital elements in complete air-conditioning for summer and winter—warming, humidifying, cleaning and circulating in winter, and cooling, dehumidifying, cleaning and circulating in summer.

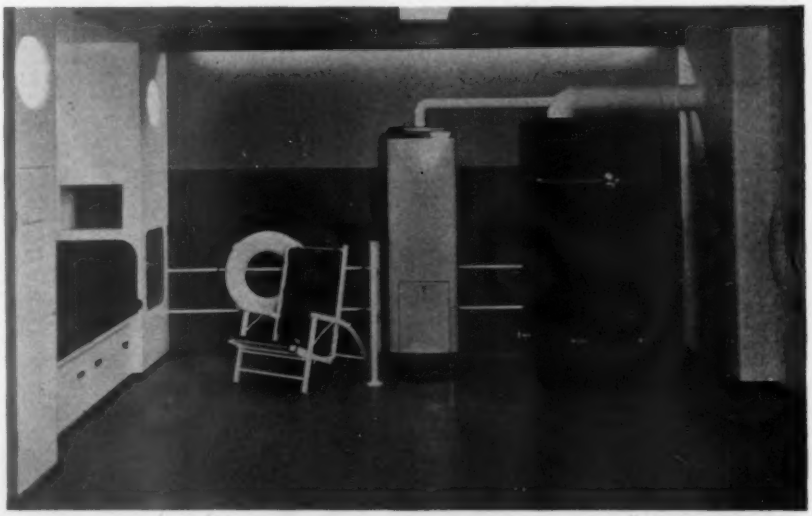
Particularly attractive to women customers was "America's Finest Kitchen" in the center of the main floor lobby. It was designed by the Company's Kitchen and Basement Planning Bureau, under the direction of Harry Swenson, and depicted a forward stride in kitchen design, with charming color combinations giving it a cheery atmosphere. The kitchen was divided into two sections, each with large wide-paned windows, and separate color treatment. In one section were located the range, electrolux, sink, recipe table, and cabinets, and the adjoining room was a breakfast room with roomy table and four chairs done in light oak and ivory colored leather. Both sections were provided with ample closet space, and recessed shelves for clocks, barometers, and other kitchen accessories.

The ranges on exhibition in the kitchen were changed every few days to give equal display opportunity to the makes of various range manufacturers.

Another feature of the "Open House" was a puppet show, located on a large stage on the main floor, which told by voice recordings and the movements of the foot-high puppets an interesting story of an average family, how home service and gas service entered their lives, and how the despicable character, "DIRT," was routed from their home by gas heat.

At 2:30 every afternoon during the month except Saturday and Sunday, on a platform erected in full view of the model kitchen bungalow, a style show was staged, showing the latest in women's wearing apparel for fall and winter. The style show, including the professional models, was furnished by several downtown department stores in turn.

The regular sales room, adjoining the main floor lobby, in addition to the regular display of appliances, contained a "Nautical Basement," fashioned from a boat's cabin interior, complete with portholes, steamer chairs, a bunk seat, and a



The blue and white "Nautical basement", open to the public at the Peoples Gas heating and air conditioning show, embodies the cool atmosphere of a ship's deck, and simplicity of lines in the furniture. Designed in harmony with the modern water heater and the gas fired furnace.

window through which a variety of watercraft was realistically pictured lying at anchor in a harbor. In the same salesroom, another model kitchen, which could be viewed from the street through the outside sales window, gave cooking demonstrations and dispensed refreshments to the visitors.

To act as hostesses, and to assist in directing the thousands of visitors, fifty-five "personality girls" were elected from the ranks of the Company's employes, by a general election sponsored by the Peoples Gas Club. Each of the fifty-five girls was presented with a gift, at an employes' "Open House" night, at which time a special style show, with dancing and entertainment was staged for the Company's 4,000 employes and their friends.

The large attendance at the show during the first week proves that thousands of gas customers are "comfort minded," and the show, with its modern displays of gas designed heating and air conditioning and the model kitchen, has acquainted many of them with the fact that gas service is in step with the latest strides of science and industry in contributing to the comfort of the modern home.

The exhibitors in the show were: The American Foundry and Furnace Company, Air Conditioning Corporation, Mueller Furnace Company, Surface Combustion Company, American Gas Products Company, American Radiator Company, Crane & Company, Bryant Air Conditioning Corporation, Trane Company, James B. Clow & Sons, General Gas Light Company, National Radiator Corporation, Forest City Foundries Company, The Moore Corporation and the Autogas Corporation.

Gas Cooking "Sold" To Home Economics Leaders Through Modern Animated Display

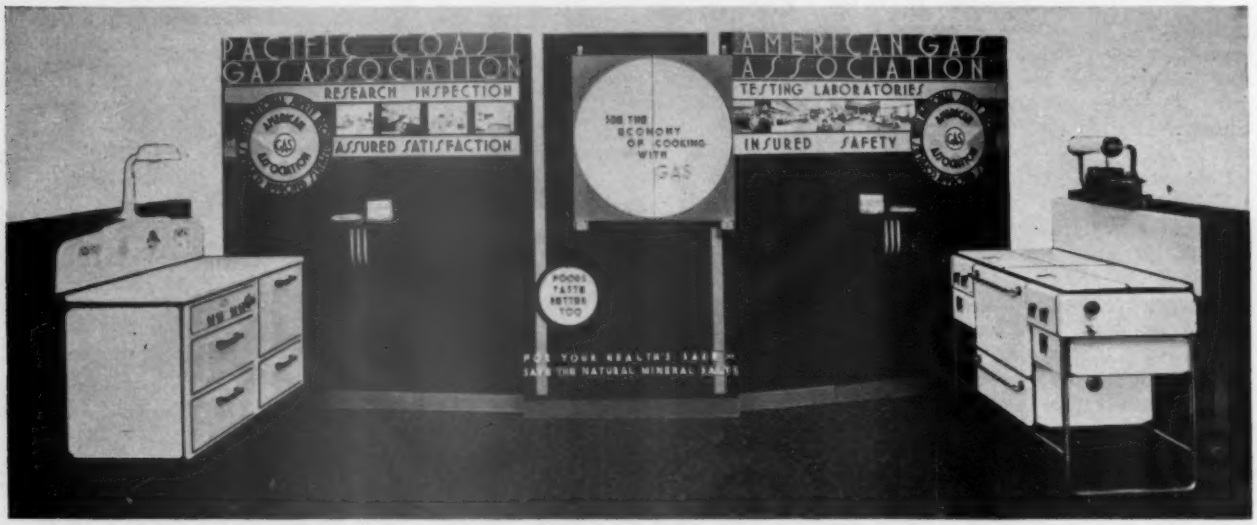
BY "bringing to life" in animated display vivid concepts of the economy, convenience, and high quality of cooking with gas, the cooperative exhibit of the American Gas Association and Pacific Coast Gas Association at the 1936 convention of the American Home Economics Association in Seattle, Washington, July 6-9, did an unusual job of selling gas to hundreds of Home Economics leaders from all parts of the country. The exhibit also featured the "Assured Satisfaction" and "Insured Safety" of cooking with gas ranges approved by the American Gas Association Testing Laboratories, and included for inspection three actual models of modern gas cooking appliances.

The central attraction of the display was a moving picturization of whole meal cookery exhibited within an articulated rear wall cabinet labeled "See the economy of cooking with GAS." The cabinet opened at regular intervals disclosing a closed aluminum kettle over a modern gas burner in flame. As viewers gazed, the lid rose gently, a savory dish of pudding emerged, two dishes of vegetables followed, and finally a handsome roast with browned potatos, onions and carrots appeared from the pot. All these items in glass containers remained suspended in spaced position above the pot for an instant before the cabinet doors reclosed. The base and rear of the enclosure were of dark blue velvet. On the inside of the cabinet doors was lettered the title of the animated feature, visible while the doors were swung wide, "The whole dinner cooking at one time over one gas flame turned low."

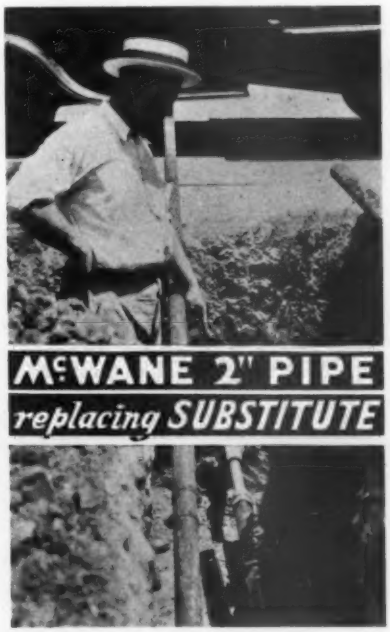
The Laboratory Seal of Approval of the American Gas Association flanked each of two rows of enlarged photographs depicting Laboratory testing operations and model all-gas kitchens.

To L. E. Lindsay, Director, Display and Advertising in the Seattle Gas Company, goes the credit for the construction of the Exhibit and all details were under the supervision of James F. Pollard, President of the Seattle Gas Company.

A leaflet cast around the query, "Do you know ——?", and emphasizing the contributions of the gas industry to the science of homemaking was distributed in quantity, as was the two-color Tenth Anniversary Booklet outlining the work and progress of the Testing Laboratories program of the American gas industry. Display copies of other literature were available for inspection in connection with a registration book for ordering duplicate copies.



Animated Display of Cooperative Exhibit A.G.A. and P.G.A. in Seattle, Wash.



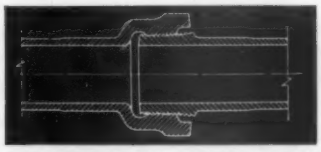
SIZES 1¼" thru 12"

McWANE 2"-18FT. LENGTH — TAPPING COLLAR — 2½" OVERSIZE M.&F. THREADED JOINT

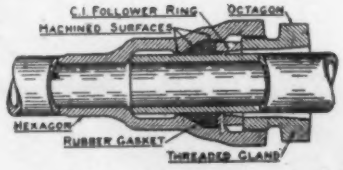
THE *LAST* DITCH!

When McWane Cast Iron Pipe is laid the last ditch is dug. No costly replacements, as in this case, for **Cast Iron lasts for centuries.**

Flexible! High tensile and transverse strengths make it easy to lay McWane pipe around curves. Full internal diameter. Mechanical Joints that stay bottle-tight no matter how much gas pressures are increased. McWane adds another advantage . . . 50% less joints . . . only **one** intermediate joint in each 18 foot length.



McWANE OVERSIZE MALE and FEMALE THREADED JOINT is the only joint as strong and permanent as McWane Cast Iron Pipe. And it stays bottle-tight no matter how much gas pressures are increased.



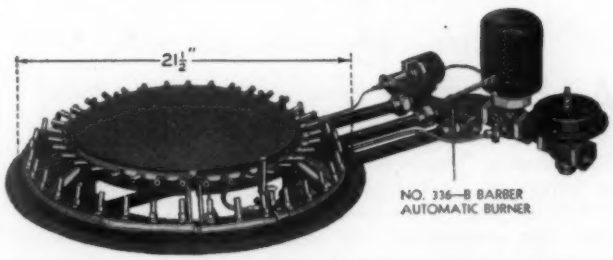
McWANE GLANTITE MECHANICAL GAS JOINT inserted at intervals in the line to take care of expansion and contraction. Complete line of All Bell Glantite Fittings!

McWANE CAST IRON PIPE CO. BIRMINGHAM ALABAMA

PACIFIC STATES CAST IRON PIPE CO. PROVO, UTAH

Branch Offices: Chicago, Dallas, Denver, Kansas City, New York, Portland, Ore., Salt Lake City, San Francisco, Los Angeles

What BARBER BURNER "LEADERSHIP" Means to You



The impressive record of Barber Automatic Gas Conversion Burners, over a period of more than 18 years, has a definite meaning for you. You are interested in *bigger sales*—"clean" sales—without frequent servicing and removals. Your customers insist on *trouble-free* heating and *sensible* fuel costs. Barber Burners have exclusive, patented features of *combustion* and *operation* which no other burner *can* copy. By unquestionably superior performance, Barber Burners have won the loyal support of a host of *alert* and *substantial* Heating Dealers and Gas Appliance Manufacturers.

Eight "tailor-made" sizes to accommodate round grate diameters from 12" to 34". Also "tailor-made" to SUIT and FIT the grate dimensions of oblong furnaces or boilers.

Insure a "scrubbing" flame action on side walls of firebox, at the proper level, with 1900° Fahrenheit flame temperature.

No fire brick or refractory elements needed to deflect the flame to the side-walls.

Barber Burners require only 70% of the installation time of average Burners using refractories.

Equipped with the impoved Barber vacuum-principle noiseless jets, unequalled for air-mixing efficiency, unaffected by dirt, corrosion or condensation.

Furnished with "Baltimore" or "Klixon" Safety Pilot Control—positive and accurate.

Listed in the A.G.A. Directory of Approved Appliances.

We supply Sales Literature, Specification Data Sheets and Practical Sales Assistance. Write at once for our new Illustrated Catalog No. 37 and Revised Price List.

THE BARBER GAS BURNER CO.
3704 Superior Ave. Cleveland, Ohio

Address Michigan Inquiries to
The Barber Gas Burner Company of Michigan
4475 Cass Ave., Detroit, Mich.

BARBER *Automatic* JET GAS BURNERS

for Warm Air Furnaces, Steam and Hot Water Boilers
and Numerous Other Heating Appliances

An Improved Liquor Sealed Standpipe Valve For By-Product Coke Ovens

AN interesting example of improvement in design is found in the liquor sealed standpipe valve for by-product coke ovens, as shown in the accompanying illustrations. The initial battery equipped with this type of valve was at the plant of the Ironton By-Product Coke Company at Ironton, Ohio. This 25-oven installation has served for five years without any expense whatever for maintenance, replacement or repair and has made possible a material saving in operating labor costs. Two additional batteries have been so equipped within the last year, one at the plant of the Semet-Solvay Company, Detroit, and the other on the Otis Steel Company ovens at Cleveland, on batteries of 20 and 51 ovens respectively.

The standpipe lined with refractory material, and the vertical portion of the angle connection with standpipe cap, are, in general, of the usual type, as is also the oven collecting main equipped with Semet-Solvay liquor flush. The liquor sealed standpipe "valve" is unusual in that it involves no major moving parts. The valve is opened or closed by making or breaking the seal in the bowl by means of the Corliss plug cock at its bottom, the opening of which is 1½" by 6". The design of the valve permits of a short center to center distance between the standpipe and the main, and also of a very low standpipe. By means of the liquor spray in the angle connection, the very materially reduced inside area of the valve and the connection is kept constantly cooled and wetted, precluding tar or pitch deposits requiring mechanical removal. A minor deposit of such material is formed on the flat area at the bottom of the angle connection, which can be removed with a light bar at charging time. From the details given in figure No. 2, the ample size of the gas passage and also of the drain cock opening are apparent.

The spray system consists of one in the angle connection and two in the oven collector main, for each

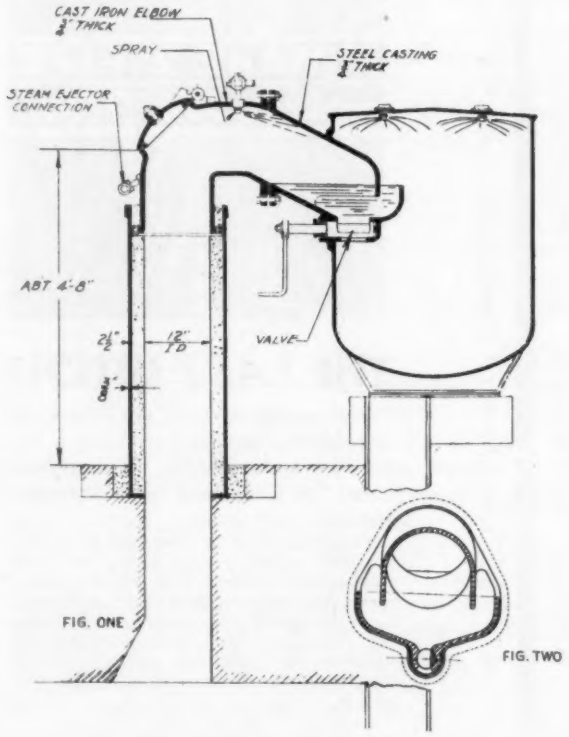


Figure 1. This drawing shows the arrangement of the uptake pipe, liquor sealed valve and collector main and indicates the sprays and the liquor level when the valve is closed. All parts are accessible from the battery pavement.

Figure 2, (insert). A sectional view of the valve in the open position. Note the ample passageway for the gas.

Figure 3. General view of an installation recently completed, on the plant of the Otis Steel Company, Cleveland. Note the short standpipe and general simplicity of design.

oven. The effectiveness of the installation is indicated by the fact that it eliminates the necessity of "tar chasing" of the main. The operation and inspection of the standpipe valve can all be accomplished from the battery

Figure 4. Close-up of standpipe at coke oven plant of the Otis Steel Company, Cleveland, Ohio. The operator is cleaning the small flat area at the bottom of the angle connection while the oven is being charged.

top. A daily inspection of the collector main spray system suffices for the maintaining of satisfactory operating conditions.

This improvement is a development of the Semet-Solvay Engineering Corporation of New York.

B. W. Lynch, President Standard Gas & Electric Co.

Bernard W. Lynch has been elected president of Standard Gas and Electric Company, succeeding John J. O'Brien who died August 7. Mr. Lynch has resigned as director and vice president of H. M. Byllesby and Company with which he has also been associated for many years.

Mr. Lynch has been identified continuously with the development of the Standard Gas and Electric group of utilities since 1905. This organization is now one of the largest of its kind, its operating units comprising ten principal groups with properties in many communities, including Pittsburgh, Minneapolis, St. Paul, Louisville, Oklahoma City, San Diego and San Francisco.

Action of the board of directors of Standard Gas and Electric Company in electing Mr. Lynch was confirmed today by the United States District Court in Wilmington, Delaware, where the company is in process of reorganization under Section 77-B of the Bankruptcy Act. The court also approved reduction of the number of directors from 15 to 12. Mr. Lynch is 52 years old and a resident of Chicago.

R. J. Graf, President H. M. Byllesby & Co.

Robert J. Graf of Chicago has been elected president of H. M. Byllesby and Company to succeed the late John J. O'Brien. He has been first vice president since 1924.

Joseph H. Briggs, vice president, has been elected chairman of the executive committee.

Mr. Graf was one of the original partners of the Byllesby Company when it was founded in 1902. The company was a pioneer in the development of utilities, particularly power and light properties, and in 1910 organized Standard Gas and Electric Company.

Mr. Graf, who is 54 years old and a native of Washington, D. C., is well known in the investment banking field. His first executive position with Byllesby and Company was secretary and assistant treasurer.

Pipe Corrosion and Coatings

(Continued from page 24)

the soil acted as an agent in providing one of the three essentials of a galvanic cell.

Appearance of Galvanic Corrosion

The appearance of metal corroded by galvanic or battery action, frequently can not be distinguished from the effects produced by other types of corrosion. The actual reason for corrosion, therefore, must be sought in the surrounding conditions, rather than appearances. However, if the corrosion noted is uniform in nature, it does eliminate galvanic action as a possible cause, except where graphitization has occurred on cast iron.

Even with cast iron, the result of galvanic action is seldom uniform and in all instances is confined to distinct pitting or intensified corrosion within a small area, although numerous small areas of galvanic action may exist in close proximity to one another. When first exposed, the results of galvanic action leave a clean ordinary shiny surface of the metal, where the action has been concentrated, even though this surface may be very irregular in contour. On exposure to atmospheric conditions, the corroded area rapidly becomes dull and quickly oxidizes. A difficulty of assuming causes, exists from the fact that other types of corrosion frequently occur simultaneously and may affect the sur-

Electrolysis—apparently from stray currents.

face appearance of the corroded area, but the existence of a single or many shiny pits, rather than a uniformly shiny surface, would be a justifiable reason to suspect electrolysis.

The complexity of galvanic action and the impossibility of accurately predicting the effect it may have on a structure, justifies eliminating dissimilar metals whenever practical, and using due precautions to avoid stressing of a metal. When the existence of two metals cannot be avoided, every effort should be made to prevent the electrolyte from coming in contact with the two bare metals simultaneously. Coating of either or both of the metals may be a temporary expedient but the permanency of any coating is a factor and will be discussed later.

(Note:—Part No. 4 dealing with stray current electrolysis will appear in the October issue.)

News of the Industry

Owens Heads New Business Department At Brooklyn Union

George F. B. Owens has been appointed acting manager of the Brooklyn Union Gas Co. new-business department.

Mr. Owens, who had been domestic sales manager for more than five years, succeeds Mr. Cuthrell who was elected assistant vice-president early this year. Mr. Cuthrell will henceforth devote himself to executive duties in connection with new-business operations.

Walter E. Bolte, who had been wholesale sales supervisor for more than five years, succeeds Mr. Owens as domestic sales manager. Willard C. Wolff, who had been district sales manager for Nassau Branch since September 1, 1935, is the new wholesale sales supervisor. Castle Moore, a house-heating supervisor, takes Mr. Wolff's place as district sales manager for Nassau Branch.

A new division in the new-business department was also announced. This new unit is the commercial division which will be headed by Joseph F. Quinn as commercial sales manager. Mr. Quinn had been a supervisor in the industrial division for the past 11 years.

There will be two sections in the new commercial division. One will handle general commercial sales and will be under the supervision of Charles Aspinwall, who has supervised sales of hotel and restaurant equipment for the past 13 years. The second section will take care of commercial heating equipment and will be under the supervision of Harold Birkett, who has been in the industrial division for the past five years.

R. H. Burdick with J. G. White Engineering Corp.

The J. G. White Engineering Corporation of New York has announced the election of Mr. R. H. Burdick to head its fast expanding Gas Engineering Department.

Mr. Burdick, who is responsible for many of the progressive measures adopted by the gas industry, began his public utility career 28 years ago, as assistant superintendent of the John O'Connell Works of the Consolidated Gas Company of New York and later of the Central Union Plant of the same company in the Bronx.

From 1910 and into 1912 he served as superintendent of the Consolidated Gas and Electric Company of San Diego, California.

For the succeeding thirteen years, Mr. Burdick was chief gas engineer of the Electric Bond and Share Company of New York, resigning from that post in 1925 to take over the direction of a series of gas, electric, water and telephone properties under the ownership of Great Lakes Utilities Corporation, Genesee Valley Gas Company and the Colonial Utilities Corporation, in which concerns he was financially interested.

Since 1930, he has been assistant chief engineer of Columbia Gas & Electric Corporation.

The J. G. White Engineering Corporation has found an increasing demand for the services of its gas engineers, as well as in other branches of its engineering and construction business.

A. R. Ellis, President Pittsburgh Testing Laboratory

A. R. Ellis, recently elected President of the Pittsburgh Testing Laboratory, entered employ of the laboratory in 1905. He was appointed chief engineer in 1910, manager of the New York branch in 1917, general manager and director in 1921 and vice-president in 1929.

Lincoln Completes Negotiations for Sales and Manufacturing Rights of German Oxygen Machine

Mr. J. F. Lincoln, President and General Manager of The Lincoln Electric Company, Cleveland, Ohio, has just returned from a business trip to Germany, which he made to investigate a new type of machine for manufacturing oxygen.

While in Germany, Mr. Lincoln completed negotiations with The Messer Company, Frankfort on Main, Germany, for representation in the United States. The Messer Company are the designers and patentees of a low priced automatic oxygen machine whereby users of oxygen for cutting and welding by the acetylene process can produce oxygen in their own plant at low cost and thus reduce the cost of doing this work to a point much lower than heretofore.

Due to the low first cost and very economical operating costs it is believed that this equipment will be of great interest to plants who use as low as 500 cu. ft. of oxygen per day.

Mr. Lincoln reports that The Lincoln Electric Company will handle all negotiations for use of any equipment sold or manufactured under the Messer patents in this country. It is expected that a demonstration plant will soon be installed in the plant of a large user of oxygen near Cleveland and will be available for observation by anyone interested.

Fisher Governor Co. Appoints Factory Representative in Chicago

Fisher Governor Co., Marshalltown, Ia., have appointed as direct factory representatives, General Meters & Controls Co., 205 W. Wacker Drive, Chicago, Ill.

The personnel of the General Meters & Controls Company will include E. A. Rhodes, James A. Riggs, and A. J. Foley, who have during the past several years been actively engaged in the engineering, sales and service of Fisher controls.

"Over 40 Million Tons"

Above is the title of an attractively printed folder just published by Appalachian Coals, Inc., Cincinnati, Ohio, listing the producing companies which mine the high volatile coals distributed by this pioneer regional marketing agency.

Established in April, 1933, the Appalachian organization markets the products of its affiliated producers from Kentucky, Tennessee, Virginia, and West Virginia, offering "standardized ACI Coals" which can be purchased on "the same simple basis as industries buy brick, copper, iron, rubber, steel, and other materials."

New England Gas Association Meetings

The directors of the Operating Division of the New England Gas Assn. have voted to hold the next meeting in Hartford on Friday evening, October 2, and Saturday morning, October 3, at the Hotel Bond.

The directors of the Accounting Division have voted to hold the next meeting at the Narragansett Hotel in Providence on Thursday evening, October 15.

Coming Events

September

12 Maryland Utilities Association, mid-year meeting, George Washington Hotel, Ocean City, Md.

October

1-2 Empire State Gas and Electric Association, annual convention, Saranac Inn, Saranac, N. Y.

2-3 New England Gas Association, Operating Division, Hotel Bond, Hartford, Conn.

15 New England Gas Association, Accounting Division, Naragansett Hotel, Providence, R. I.

19-23 National Metal Show and 18th Annual Convention, American Society for Metals, Public Auditorium, Cleveland, O.

Week of October 25 American Gas Association, 18th annual convention, Atlantic City, N. J. Alexander Forward, managing director, 420 Lexington Ave., New York.

October 25-30, Inclusive, Exhibition of Gas Appliances and Equipment at the First Annual Convention Association of Gas Appliance and Equipment Manufacturers in Affiliation with the Eighteenth Annual Convention of the American Gas Association, Atlantic City Auditorium, Atlantic City, N. J.

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Gas Meters
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HEATING BUNKER "C" OIL

for carburetting gas requires high pressure and high temperature.

ANDALE BOWED TUBE HEATERS

remain tight and are easily cleaned. These are the requirements for continuous satisfactory operation.

ANDALE COMPANY
1600 ARCH STREET
PHILADELPHIA

The Outstanding Gas Purifying Material » » »

Highest H_2S removal combined with complete removal of traces. Physical structure insures very low box back pressures.

THE RECOGNIZED PURIFYING MATERIAL FOR VAPOR PHASE GUM CONTROL.

Ask for our new bulletins Nos. AL-18-19 which are very interesting

THE ALPHA-LUX COMPANY, Inc.
192 Front St., New York
Philadelphia **Chicago**

New Gas-Fired Unit

The air conditioning division of Gar Wood Industries, Inc., Detroit, Mich., is now marketing a new, Gar Wood automatic heat and air conditioning system which is fired by gas. Heretofore, all of the Gar Wood heating and air conditioning units have been designed exclusively for the use of fuel oil.

"The new gas-fired Tempered-Aire model possesses many innovations and distinctive features.

"Practically all of the heat that is generated is trapped and used. The entire

heating surface is exposed to high-velocity air. Very little of the heat is wasted by escaping up the chimney. Scientifically designed concave and convex surfaces absorb the intense gas heat through the 'scrubbing' principle."

Gar Wood Gas-Fired Tempered-Aire Units are approved by the American Gas Association. Burners, (one per section, making total of four) engineered integral with furnace. Full automatic controls including pressure regulating valve, safety pilots, Minneapolis-Honeywell gas valve, thermostat and combination furnace control. (Controls 60 cycle-A.C. standard.)

Cut-away picture shows the scientifically designed concave and convex surfaces absorb the intense gas heat through the "scrubbing" principle. Little heat is wasted up the chimney. The unit is entirely automatic in operation. In addition to supplying abundant, forced, warm-air heat at low operating cost, the gas-fired unit provides air ventilation and circulation, air humidification and filtration, and blower cooling in the summer. Descriptive matter will be mailed on request from the company.

Second Edition of "Modern Kitchens"

The first edition of "Modern Kitchens —A Handbook for Design and Construction" was published by American Gas Association, New York, in the Fall of 1933. More than 300 gas companies purchased copies for use as a guide in the operation of their kitchen planning departments, or as a reference work.

Many developments have occurred in the design and construction of modern kitchens since the publication of the first edition. These are fully recognized in the Second Edition, now available, and new material referring particularly to basement planning has been added. The experience of companies which have offered kitchen planning service during recent years has been incorporated in all of the recommendations given in the Second Edition.

During the past three years the modern kitchen has not only maintained its important position in the home, but has been accepted without question as one of the prime factors in good housing. With the rapidly growing volume of new home construction, it is believed that the gas industry will find more use for a handbook of this type than ever before. Recently a similar service on kitchen planning has been made available to manufacturers and distributors of electrical equipment competing with the gas industry in domestic kitchens.

In all companies where a planning department is not in operation, it is recommended that copies of the Second Edition be personally presented to the important architects in the community and to kitchen planning and equipment specialists as evidence of the company's desire to cooperate in solving these problems and of the gas industry's ability to play a vital role in the design and construction of modern homes.

Copies of the Second Edition of "Modern Kitchens and Basements" are available to member companies at the following prices:

1—10 copies, $3.00 each. All over 10 copies, $2.00 each.

The Gas Industry at the World Power Conference

The gas industry has taken a large part in the program and arrangements for the Third World Power Conference being held in Washington, September 7-12. Preparation of papers and of their summaries, assembling of statistical data, plans for effective participation by representatives of the gas industry from other countries, and arranging for the exhibit in connection with the conference, have involved an enormous amount of work throughout the summer at American Gas Association Headquarters and in its Laboratories.

Paper titled, "Power Resources, Development and Utilization" is a purely statistical summary of available data and contains only such discussions as are necessary to explain the material. Data on the gas industry were furnished in voluminous form by the Statistical Department of the Association.

"Organization of the Production, Transportation and Distribution of Natural Gas and Manufactured Gas" was written mainly by members of the Association, under the leadership of F. A. Lydecker, chairman of the Technical Section. The portion of the paper on production of manufactured gas was written by L. J. Willien of Byllesby Engineering & Management Corporation. That part which relates to the transportation of natural gas was prepared by Mr. Davidson and Mr. Bussard of the Natural Gas Pipeline Company of America under the direction of its president, Floyd C. Brown. H. E. Bates of The Peoples Gas Light and Coke Company of Chicago contributed the section of the paper dealing with distribution of natural gas and manufactured gas.

A paper dealing mainly with the production of natural gas was prepared at the request of the World Power Conference by Judson C. Dickerman of the Federal Trade Commission.

"Organization of Private Electric and Gas Utilities" was covered for both industries by J. F. Fogarty, president of the North American Company.

"Public Regulation of Private Electric and Gas Utilities" was handled for both industries by John E. Zimmermann, president of The United Gas Improvement Company.

A brief paper on the gas side of "Regional Integration of Electric and Gas Utility Facilities," was contributed by the Association, with valuable suggestions from Chairman Moeller of the Natural Gas Department.

As of August 4th the American Committee of the World Power Conference announced that authorities from fifteen countries had at that time submitted papers dealing with gas and that a total of thirty-five papers had been received on gas topics, including those from the United States. Other countries from which papers relating to the gas industry had been received are: Argentina, Austria, Belgium, Canada, China, Czechoslovakia, Denmark, France, Germany, Great Britain, Holland, Hungary, Japan, Norway, Poland, Russia and Switzerland.

All papers are being pre-printed for distribution prior to the conference.

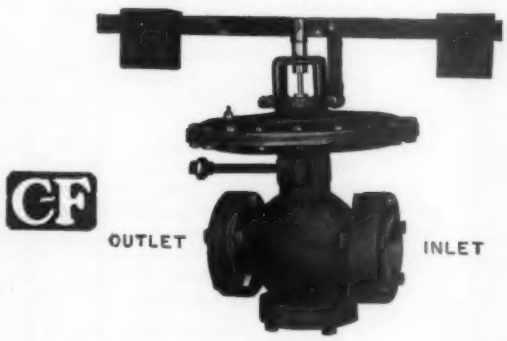
An exhibit has been assembled and is on display in Washington, in the New National Museum.

It occupies the best position in the National Museum, in the center of the main hall just inside the main entrance and visible even from the street. It is forty feet in length and its paneling is in three sections; first, production and transportation of natural gas; second, utilization of gas in home and industry and third, production of manufactured gas. The whole affair is cleverly illuminated and carries brief but important striking statistics. The exhibit was arranged by Chairman Lydecker of the Technical Section and Robert A. Carter and Raymond M. Martin, Consolidated Edison Co., New York.

The Washington Gas Light Company has arranged in its own building, gas appliances for inspection by foreign delegates and others.

The Association of Gas Appliance and Equipment Manufacturers, through their committee and general secretary, Mr. Berghorn, extended the fullest cooperation in arranging the exhibit.

Where Inlet Pressure Is Low



THE *Fulton Weighted Illuminating Regulator*, designed for either natural or manufactured gas, will reduce from inlet pressure of 15 lbs. or less to any delivery pressure between one ounce and 5 lbs. No stuffing box, practically frictionless, highly sensitive, specially adapted for use where difference between inlet and outlet pressure is very slight. Ask for full information about this regulator or any requirement of pressure control.

The Chaplin-Fulton Mfg. Co.

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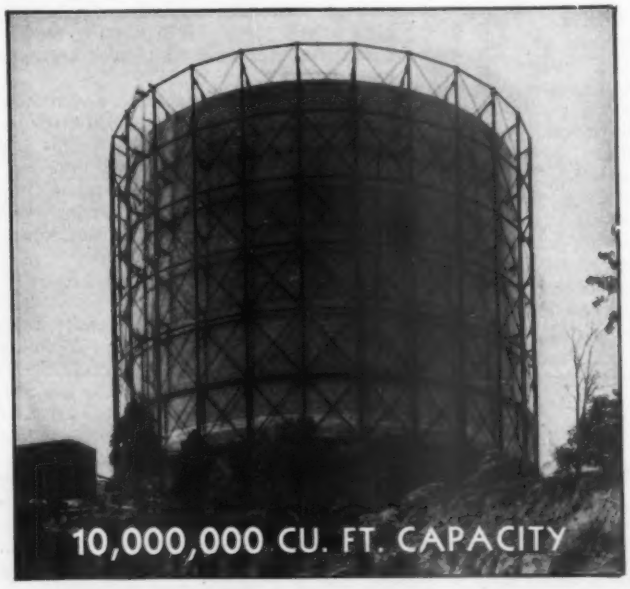

HIGH PRESSURE GAS HOLDERS LOW PRESSURE

PURIFIERS · TANKS · CONDENSERS
STEEL PLATE CONSTRUCTION

INTEGRITY GOOD WORKMANSHIP FAIR DEALING

CRUSE-KEMPER CO.
AMBLER, PA.

the solution to many Metering Problems

Typical of a wide variety of conditions readily handled by "R-C" Positive Displacement Meters is the situation in this gas plant. The meter shown is measuring gas used by the engine for boosting coke oven gas up to line pressure. Pressure at the meter varies from 6 to 30 lbs.

Advantages inherent in the rugged simplicity of "R-C" Meter design include such things as (1) eliminating any danger of collapsing the meter due to suction where meter is installed on the intake of an engine; (2) accurate, easily read record of gas measured; (3) no possibility of its getting out of adjustment since displacement is machined in; (4) low operating differential; (5) accuracy over a range of flow varying from 10% to 150% of normal rated capacity.

A study of the way in which "R-C" meters can meet your specific operation conditions will be made by our sales engineer without obligating you in any way.

"Tomorrow's Engineering Approved by Yesterday's Experience . . . "

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Porcelain Enamel Institute Issues New Booklets

The Educational Bureau of the Porcelain Enamel Institute, 612 No. Michigan Ave., Chicago, announces the publication of four sample copies of booklets, which may be obtained without charge by anyone interested in the use of porcelain enamel.

Two of the booklets, "Handbook on Design of Metal Parts for Porcelain Enameling—No. 1" and "Reflectance Test for Opaque White Porcelain Enamels," are of a technical nature. The design handbook, according to the Institute, gives authentic, practical information as to the basic requirements for the proper designing of pressed steel shapes to be porcelain enameled. The reflectance test booklet is a tentative standard for conducting reflectance tests which has been approved by the Technical Research Section of the Institute's Educational Bureau.

The Institute's "Sales Manual for Porcelain Enamel," discusses all phases of enameling and offers constructive selling points for the manufacturer, distributor and retailer.

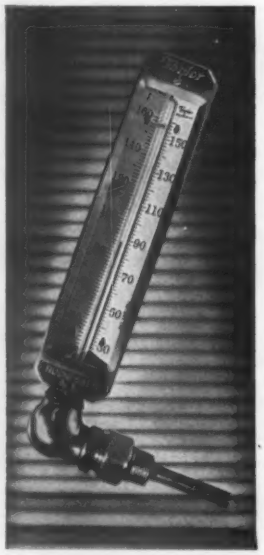
George P. MacKnight has returned to the Porcelain Enamel Institute, 612 N. Michigan Avenue, Chicago, Illinois, as Secretary, to succeed Kurt R. Groener, who has resigned.

H. H. Cuthrell Elected Vice-President of Brooklyn Union Gas Co.

At a meeting of the Board of Directors of the Brooklyn Union Gas Co., held August 27th, Hugh H. Cuthrell former New Business Manager and Assistant Vice President was made Vice President in charge of sales. Mr. Cuthrell entered the employ of Brooklyn Union in 1927 as engineer's assistant.

Science Improves Readability of Thermometers

Mercury-in-glass Industrial Thermometers always have been difficult to read except at very close range and under most favorable lighting conditions. That characteristic not only discouraged frequent readings, but was responsible for many erroneous readings as well. The Taylor Instrument Companies, Rochester, New York, claim to have corrected this



difficulty in a fundamental manner by a uniquely designed thermometer tube which is extremely easy to read.

This new thermometer tubing, known as "Binoc," is described as an outstanding achievement of modern optical science. Advantages of the design include: More than twice the accustomed angle of vision combined with high magnification of the mercury column. . . . Binocular vision (i.e., readability with both eyes) at normal or greater than normal distances; whereas it previously was necessary to stoop and squint. . . . Triple-lens construction gathers three times as much light and concentrates it behind the mercury column, making the column stand out in sharp relief. . . . Confusing empty-bore reflections are eliminated by the scientifically determined lens angle and extended opaque background.

Bulletin 99023 which describes this new development, will be mailed on request.

The *Test* of REPETITION

A STABLE & PROGRESSIVE industry operates on a stable & progressive policy. *"I know of no way of judging the future but by the past,"* said Patrick Henry. In 1936 to date, GPM received orders for over 1,000,000 bushels of iron boring oxide sponge.

Gas Purifying Materials Co. Inc.

L. I. City, N. Y. & Providence, R. I.

GPM IRON HYDROXIDE

New Barber Burner Catalog Contains Valuable Data Material

The Barber Gas Burner Co., Cleveland, O., recently issued a very complete catalog, 44 pages, printed in two colors. They have added a number of new burners to their line, and all are illustrated and described, and complete specifications, and sizes for each type of burner is given. Seven pages are devoted to specification charts, complete to the last detail. Barber burners are especially adaptable for air conditioners, boilers, circulating heaters, clothes dryers, coffee roasters, garage heaters, hair dryers, floor furnaces, space heaters, ranges, steam tables, unit heaters, ovens, and other appliances. It contains a fund of valuable data not included in most catalogs. A copy will be mailed on request to Barber Gas Burner Co., 3702 Superior St., Cleveland, O.

Gas Utility Revenues Gain in First Six Months

New York, N. Y., August 27, 1936.—Domestic customers served by manufactured and natural gas utilities totaled 15,164,100 on June 30, an increase of 26,000 during the first six months' interval, according to Paul Ryan, Chief Statistician of the American Gas Association.

This gain in customers is reflected in the fact that a total of 700,000 gas ranges were sold in the country during the first half of 1936. This was an increase of nearly 30 per cent over the first six months of 1935. Approximately 80 per cent of such sales consisted of relatively high priced ranges incorporating modern automatic features, such as oven-heat control, etc.

Revenues of manufactured and natural gas utilities aggregated $418,914,100 for the first six months of 1936. This was an increase of 7.4 per cent over the corresponding period of 1935. Revenues from industrial and commercial users increased 15.7 per cent, while revenues from domestic customers gained 4.1 per cent.

Manufactured gas industry revenues totaled $196,732,400 for the first six months, a gain of 2.1 per cent. Revenues from industrial and commercial uses of manufactured gas gained 11.0 per cent. Revenues from domestic uses, such as cooking, water-heating, refrigeration, etc., were 1.2 per cent less than for the corresponding period of 1935.

Revenues of the natural gas industry for the first six months amounted to $222,181,700, a gain of 12.6 per cent over a year ago. Revenues from industrial uses increased 20.0 per cent, while revenues from domestic uses gained 9.3 per cent.

Request for Cooperation with U. S. Dept. of Labor

The regular quarterly Autumn collection of retail prices by the United States Bureau of Labor Statistics for purposes of computing changes in the cost of living will be made as of September 15, Commissioner Lubin recently announced. The Bureau collects retail prices of com-

HOTEL CHELSEA

RIGHT ON THE BOARDWALK

CHOOSE THE CHELSEA FOR YOUR PERSONAL HEADQUARTERS DURING THE CONVENTION WEEK OF OCTOBER 25TH.

The Chelsea is located on the Boardwalk only a few blocks from the Municipal Auditorium.
Special daily Convention Rates—European Plan

Double room & bath $5, 6, 7, 8
Single room & bath $3, 3.50, 4, 5
If American Plan is desired the additional daily rate per person is $3.00.
Make your Reservations now

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JOHNSON No. 305

Soft Metal Melting Furnace

Johnson Soft Metal Furnaces are the most efficient, durable and economical melting furnaces made. Equipped with four powerful No. 14 type "A" Bunsen Burners, the No. 305 has a capacity up to 300 pounds. This furnace does a fast job of melting lead, babbitt, tin, type metal, solder, scrap and other low or medium fusion metals without forced air blast. The specially designed draw-off value will not freeze. Convenient working height —31" from floor. Can be equipped with a steel hood to carry off smoke and fumes and protects the metal from oxidizing action. Detailed catalogue on request.

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Cedar Rapids IOWA

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NO NEED TO EXPERIMENT WITH TRIAL LOTS . . . . .

LAVINO ACTIVATED OXIDE

ACTUAL RESULTS
secured by a large
EASTERN GAS COMPANY
WITH LAVINO ACTIVATED OXIDE

Here's accurate performance data!

Feedings	Lot No.	Bushels	Activated Oxide per Cent	Grains Absorbed	Lbs. S. Per Bushel	Remarks
1			12	271,852	153.821	10.25	
1		13,000	12	532,415	306,990		
57		13,000	12	987,456		Spent
1	61	13,000	12			11.31	
2	61	13,000			413,756	27.58	To be used
1	62	13,000	12	488,835	275,363	10.36	
2			12	882,576	414,731	13.65	To be used
1		12,000	12	292,324	127,673	9.55	
2		12,000	12	483,12	2		
1	63	13,000	15	515		16.24	Still in use
1	65	13,000	12	66	167,827	12.47	Still in use

LAVINO "ACTIVATED" OXIDE has been time-tested and proven in the field . . . has a long record of superior gas purifying performance for many leading gas companies

The facts and figures of the results obtained are adequate, significant—and yours, to examine, without obligation. Write today on your business letterhead . . . and see for yourself why Lavino "Activated" Oxide offers maximum H_2S removal—maximum activity and capacity.

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THE GOODMAN STOPPER

GOODMAN
USED SINCE 1897
2" HANDLE & LOCKING SLEEVE
GAS MAIN STOPPER

The Reliable Shut-Off for Street Mains

Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.

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modities and services that are of major importance in the budgets of wage earners and low-salaried workers.

For more than twenty years, utility companies have cooperated in this service. Rate changes for gas for residential use are reported by mail on forms provided by the Bureau, by sixty-five companies located in fifty of the larger cities of the United States.

It is important to the companies that they insure that the Bureau shall have accurate and timely data. In view of the great value to the utility industry of the data being collected by the Bureau of Labor Statistics, as a result of its regular surveys of cost of living, the utility companies in the cities covered, should request their staff to continue their cooperation to the Bureau.

Obituary

JOHN GRIBBELL

John Gribbel, Chairman of the Board of American Meter Co., and president of Tampa Gas Co., died of pneumonia August 25th at his summer home, "Weatherend," Camden, Me. He was 78.

A director of many companies and corporations, Mr. Gribbel was president of the American Meter Co., manufacturers of gas meters, and of the Tampa (Fla.) Gas Co.

He was born in Hudson City, now a part of Jersey City, on March 29, 1858, the son of James Gribbel, a manufacturer of mining tools and machinery, and Anna West Simmons.

Educated in private schools in New York and the College of the City of New York, Mr. Gribbel began work as a bank clerk in the Importers and Traders National Bank and later was in the employ of the Leather Manufacturers National Bank. In 1883 he went into the New York offices of Harris, Griffin & Co., of Philadelphia, manufacturers of gas meters.

Later he entered the succeeding firm of John J. Griffin & Co. as junior partner. In 1892, Mr. Griffin died and Mr. Gribbel bought his interests. Since that time he has been the owner and president of the concern.

Governor Fisher in 1927 named Mr. Gribbel to the Committee of the Philadelphia Foundation, designated to correct faults in the administration of charitable funds.

When the erection of the Franklin Institute Memorial on the Parkway was being planned in 1930, Mr. Gribbel contributed $50,000 for establishment of the Museum of Lighting and Illumination.

Mr. Gribbel was chairman of the executive committee of the Real Estate Trust Co., a director of the Philadelphia National Bank, and of the Insurance Company of North America.

He also served on the directorates of the Pennsylvania Sugar Co., the Indemnity Insurance Co. of North America, the Alliance Insurance Co., and the Cities Service Co.

John Gribbell

"The Evening Bulletin," of Philadelphia, in an editorial, stated:

"John Gribbel was a good and valuable citizen. That may not seem extraordinary tribute. But the cum laudes of Citizenship mean much when they are fully earned, as in his case. He measures up to, rounded out, a high American ideal of the successful life. He was capable and competent in business, successful, as the world usually measures success, in his various business enterprises, recognized and called upon for service in financial responsibilities. He did not seek public office but was ready for public service when summoned and gave of his time and ability. His integrity was not questioned; the dependability of his opinion and judgment was recognized. Moreover, he cultivated the finer things of life—humankindness in individual contacts and in the wider social field. He was cultured, a lover of art and letters, a liberal patron of genius. He was a well-rounded, healthful, helpful, man—not rare, but outstanding as a type of the complete and best success, which in its aggregated fruition has done much for national achievement and eminence. Too seldom it wins the appreciation it deserves, if as in the case of Mr. Gribbel, it is quiet, unassuming, definitely avoiding ostentation of any kind."

F. S. CHAMBERLIN

Frederick S. Chamberlain, 63, president and treasurer of the New Britain Gas Light Co., New Britain, Conn., and veteran local banker, died July 27 at his summer home in East River, Madison, Conn. He had been in ill health for several weeks.

Mr. Chamberlain was born in New Britain and started work as an office boy in a local bank. In 1928 he was elected president of the New Britain National Bank, succeeding Andrew J. Sloper, then president of the gas company.

Mr. Chamberlain continued as president of the bank and was elected president and treasurer of the gas company in September, 1933, after Mr. Sloper's death. Previously he had been vice-president and was succeeded in that post by F. M. Travis of Torrington.

IRVIN F. LEHMAN

Irvin Frank Lehman, 65, president and one of the founders of the Blaw-Knox Co., Pittsburgh, Pa., was found drowned in a foot of water in Lake Amston, near Hartford, Conn., August 5. Death was ascribed to drowning and cerebral apoplexy.

Mr. Lehman was well known in the industrial and civic life of Pittsburgh and had taken leading part in various charitable drives. He succeeded to the presidency of the Blaw-Knox Company two years ago upon the death of his brother, Albert Carl Lehman, co-founder of the company.

JOHN J. O'BRIEN

John J. O'Brien, president of H. M. Byllesby & Co. and the Standard Gas and Electric Co., died at his home in Chicago, Ill., Aug. 7 after an illness of three weeks. He was 67 years of age and the cause of death was given as a complication of heart and cerebral ailments.

John J. O'Brien

Mr. O'Brien was born in Chicago and was educated in parochial and public schools and a business college. His first job, at the age of 18, was with the Pullman Co. Two years later he joined the United Edison Co. and when that concern was merged with the General Electric Co. in 1892 Mr. O'Brien became accountant in charge.

In 1902 he became an aid to Col. H. M. Byllesby and worked with the latter in the formation of many utility companies. Mr. O'Brien was treasurer of Byllesby until 1924, when he was elected president on the retirement of Col. Byllesby.

Mr. O'Brien headed utility companies serving more than 1600 communities in 20 states and was an organizer of the Mexican States Public Service Co., Inc., a large company supplying power to several states in Mexico.

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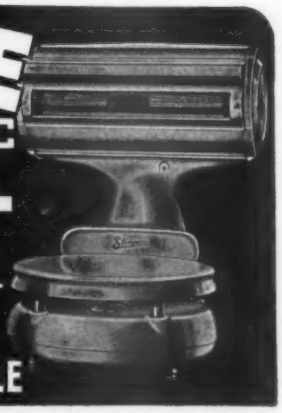

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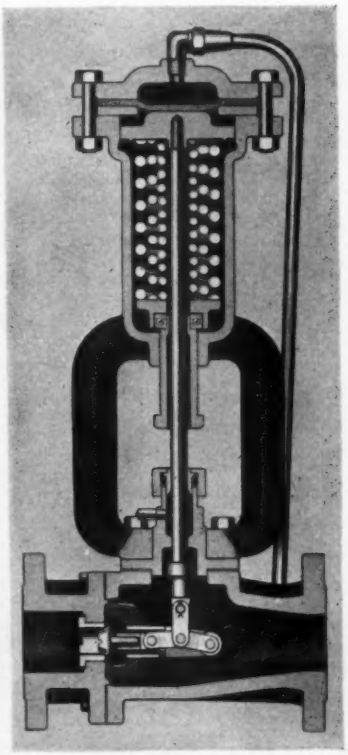

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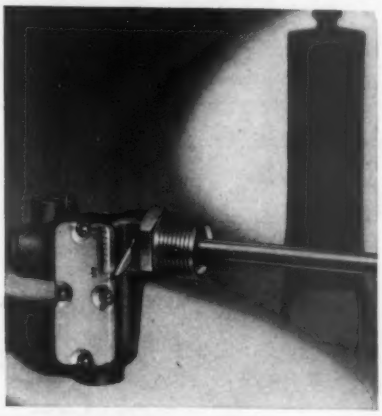

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